New Vehicle Safety and Instruction Manual

MULDOON

2016

Vehicle Identification

The vehicle identification number will be stamped onto a plate and attached to the chassis of your vehicle.

Vehicle Chassis Number:

Disclaimer

Muldoon Transport Systems Ltd will not be held responsible for information provided by suppliers of third party equipment.

It is the responsibility of the vehicle owner to ensure that drivers and/ or employees have been trained in the correct operating procedures.
This inclues the unit and/ or trailer as well as the blowing equipment. Owners have a responsibility to place emphasis on good working practice, safety procedures and accident prevention.

Thank you for choosing Muldoon for your pneumatic discharge vehicle.

All our vehicles conform to the current EC Machinery Directive and its amending directives and carry the CE marking. Your vehicle also holds a full ECWVTA (European Community Whole Vehicle Type Approval) certificate of conformity.

Thorough familiarity with your vehicle will provide you with enhanced control and safety when you use it.

We therefore request you to:

Please take time to read this Safety and Instruction Manual and familiarise yourself with the information that we have compiled for you before starting off with your new vehicle.
The manual contains information on vehicle maintenance designed to enhance operating safety while simultaneously helping you to maintain your vehicles value throughout an extended service life. For additional information, refer to the supplemental manuals.

This Safety and Instruction Manual should be considered a permanent part of the vehicle. It should always be accessible and should be provided with the vehicle when sold to provide the next owner with important Operation, Safety and Maintenance information.

Notes

Overview

Operation & Safety

Operation & Safety

Operation & Safety

Maintenance

Maintenance

Annex

ANNEX

ANNEX

Certification

CERTIFICATION

Notes

About this Operator's Manual

We have made every effort to ensure that you are able to find out what you need in this manual as quickly as possible.
The fastest way to find certain topics is by using the detailed index at the front.
If you require an intial photographic overview of your vehicle, this can be found in the first chapter.

Should you sell your vehicle, please remember to hand over the booklet, it is an important component of your vehicle.

Additional sources of information:
If you have any questions, Muldoon Transport Systems Ltd will be glad to advise you.

Symbols Used

⚠ Indicates precautions that must be followed precisely in order to avoid the possibility of serious injury and damage to the vehicle.

Your Individual Vehicle

On buying your Muldoon trailer, you have decided in favour of a trailer with individualised equipment and features. This Operation and Safety Manual describes most trailer models and equipment that Muldoon offers within the same group.

We hope you will understand that equipment and features are included that you might not have chosen for your vehicle.

Should equipment of your Muldoon vehicle not be described in the Owners Manual, please refer to any included Supplementary Operator Manuals.

Notes

Status at time of printing

Muldoon Transport Systems pursues a policy of continuous, ongoing development that is conceived to ensure that our vehicles continue to embody the highest quality and safety standards combined with advanced, state of the art technology. Thus, in rare circumstances, the features described in this Operator and Maintenance Manual may differ from those of your vehicle.

For your own safety

Maintenance and repair:
Advanced technology, eg. the use of modern materials and high performance electronics requries specially adapted maintenance and repair methods. Therefore, only have corresponding work on your Muldoon vehicle carried out by a Muldoon approved workshop that works according to Muldoon repair procedures with correspondingly trained personnel. If work is carried out improperly, there is danger of consequential damage and related safety risks.

Engine exhaust and a wide variety of components and parts found in a vehicle, contain or emit chemicals which may cause harm.
In addition, certain fluids contained in vehicles and certain products of component wear contain or emit chemicals known to cause harm.

Battery posts, terminals, and related accessories contain lead and lead compounds. Batteries also contain other chemicals. Wash your hands after handling.
Used engine oil contains chemicals that have caused cancer in laboratory animals. Always protect your skin by washing thoroughly with soap and water.

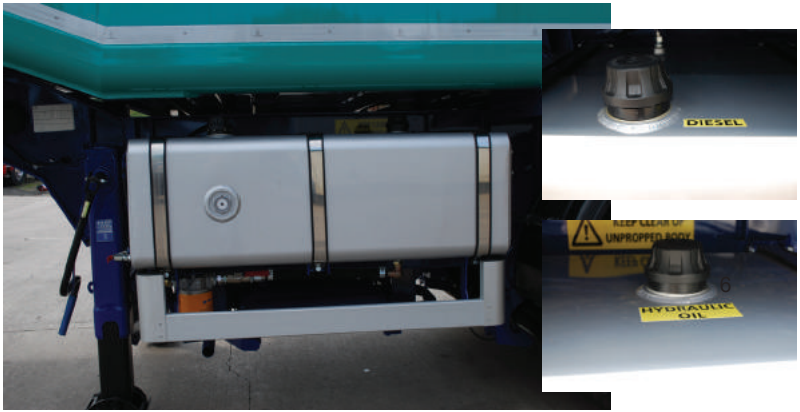
Parts and Accessories

For your own safety, use genuine parts and accessories approved by Muldoon Transport Systems Ltd.
When you purchase parts tested and approved by Muldoon Transport Systems Ltd, you simultaneously acquire the assurance that they have been thoroughly tested by Muldoon to ensure optimum performance when installed on your vehicle.
Muldoon Transport Systems will not accept liability for damages resulting from installation of parts and accessories not approved by Muldoon.

Trailer Overview - Near Side of Vehicle

Hydraulic OilFilter

Diesel & Hydraulic Tanks



Landing Legs Lever

Fuel Gauge

Delivery Hose Storage Compartment

Trailer Information Module (if fitted)
(may also be fitted on near side)

Vehicle Chassis Plate

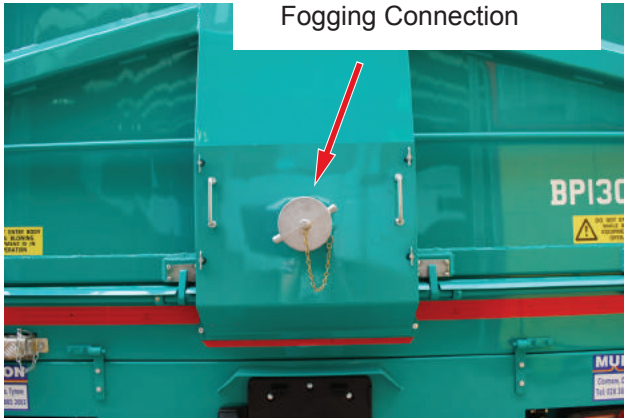
Trailer Information Module (if fitted)
Vehicle Work Lamp

Emergency Stop Switch - Immediately stop all operations

Rotary Seal | Dust Cap | Butterfly Valves | Emergency Kill Switch

Trailer Overview - Rear of Vehicle

Fogging Connection



Coded Safety Cut Off
for hydraulic functions

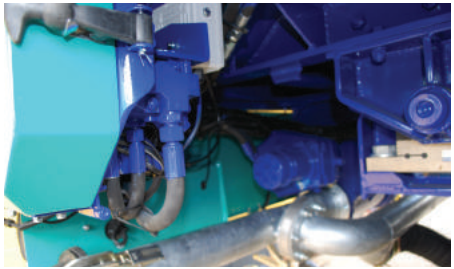
Door Fastener

Rear Ladder | Auger Cover

Trailer Overview - Off-side of Vehicle

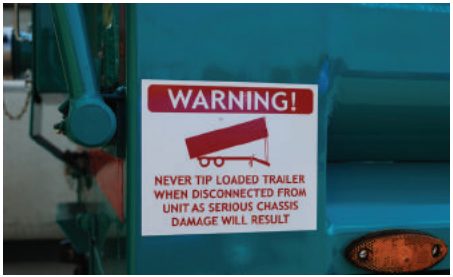
Dust Plug

Butterfly Valves



Auger | Rotary Seal | Work Lamp Controls

Cover Tensioner



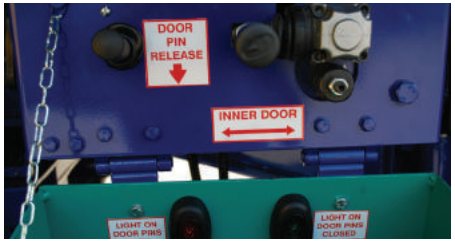
Rear Tipping Controls (if fitted)

Muldoon Auto Door Controls

See Above and Below

Tipping Control

Air Divert Valve



Inner Door Controls

Mechanism to open or close partition doors

Trailer Overview - Off-side of Vehicle

Storage Compartments | Battery Box

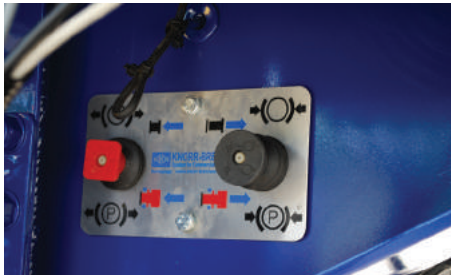
Battery | Electronics Storage

Wire Watcher Warning Light

Deep Sea Electronic Unit - Engine Start Up and throttle control

Deep Sea Electronic Unit

Stability Alarm

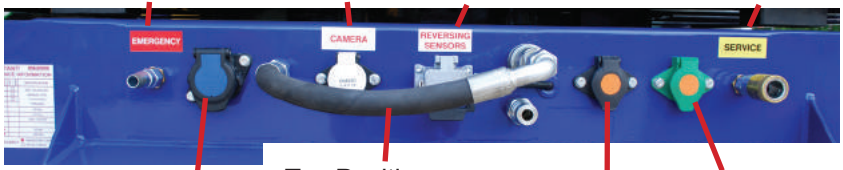


Park Shunt Valve | Parking Brake

On Board Weighing Display Unit

Traction Control

Trailer Overview - Front of Vehicle



Emergency

Camera

Reversing Sensors

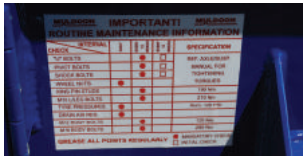
Service

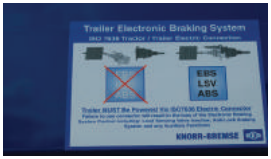
EBS

Top Position
Feed in to ram
Bottom Position
Dummy connection

Electrical Suzie

Auxilary Suzie



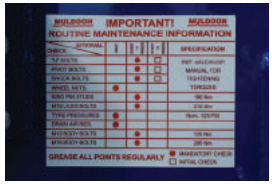


Grain Chute

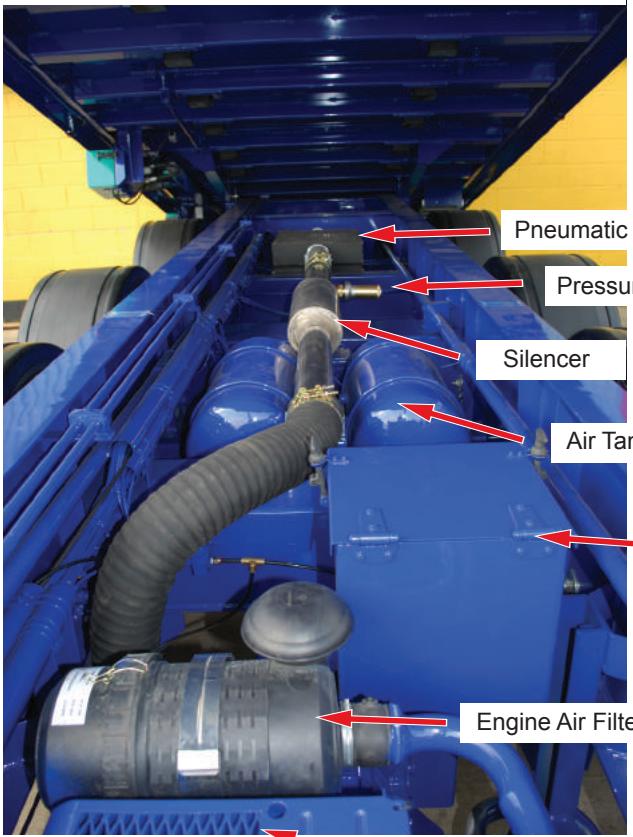
Front Filling Pipe

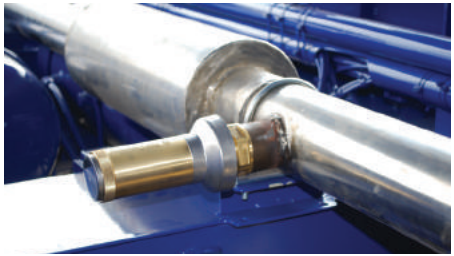
Wire Watcher
Antenna

Front Tipping
Control Box

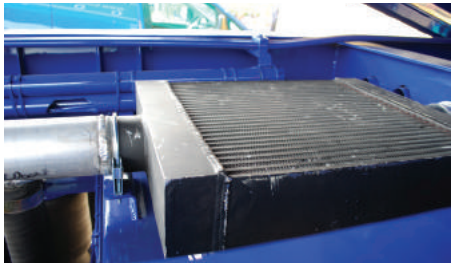


Trailer Overview - Inside Chassis

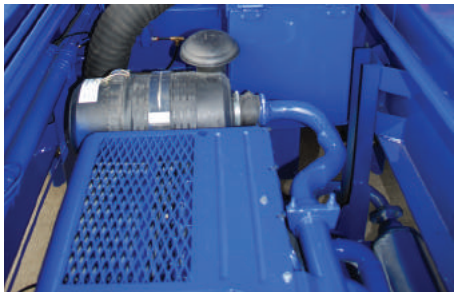




Pressure Relief Valve



Pnematic Discharge Air Cooler



Donkey Engine

Switch for Side Work Lights

Wire Watcher Control Box

Wiring for Muldoon Auto Door

Control Unit - On Board Weigher

OPERATION & SAFETY

SAFE TIPPING

⚠ **DO NOT TIP UNTIL YOU HAVE FULLY READ AND UNDERSTOOD THIS MANUAL!**

EQUIPMENT

Before tipping, confirm that the equipment is in good working order.
Check

- Hoses and fittings for abrasions and leaks.
- Security of hoist and hinge mountings.
- Check oil level
- Check where applicable that quickly detachable couplings are tight.

SAFETY

⚠ Tipping can be a dangerous operational procedure. Vehicles can overturn which can seriously hurt people or result in fatal consequences.

⚠ Ear defenders MUST be worn whilst operating engine or blower.

⚠ It is the responsibility of the operator to ensure that drivers are suitably trained in tipping a vehicle.

ALWAYS

⚠ Be vigilant for people, farm animals, obstructions or overhead cables, especially in rainy, dull or dark conditions. People, animals and plant must be kept away from vehicle during tipping.

⚠ Always verify that tyre pressures are correct before tipping.

⚠ Always ensure the load is within the maximum payload of the vehicle.

⚠ Always ensure the load is evenly distributed.

⚠ Always find a safe place to park before delivery.

⚠ Always ensure the vehicle should only be parked on firm level ground.

⚠ Always ensure the vehicle is stationary when tipping.

⚠ A safe distance should be maintained between the vehicle and overhead cables. Where fitted, vehicles high wire detection systems must be fully operational and never ignored.

⚠ Always ensure In icy conditions, tipping is carried out with particular care and check that the load discharges evenly.

⚠ Stay clear of body and tail door when body is tipped.

⚠ Articulated vehicles must be tipped with the cab and trailer in line.

⚠ Tipping should be carried out by gradually raising the body to offload the contents.

⚠ Do not tip body until necessary and not higher than necessary to reduce the risk of overturning, sufficient to offload the contents and must never be fully extended with heavy loads. ***(**Load will actually be discharged in a faster time when tipped at a lower level**)***

IMPORTANT - DO NOT OPERATE YOUR TIPPING EQUIPMENT UNTIL YOU HAVE ALSO READ AND FULLY UNDERSTOOD THE MANUFACTURERS OPERATORS MANUALS - SEE PAGES 68 TO 111 within this booklet.

⚠ Always remain alert to the possibility of loads sticking in the vehicle. Should this occur, the body must be lowered and the load freed before the body is raised again.

EXTRA CAUTION

⚠ If at any time there are signs of the vehicle toppling sideways, tipping should be stopped immediately and body lowered.

⚠ In the event of contact with cables, the driver should leave the vehicle by jumping as far clear as possible. The surrounding area should be secured, and the local electricity supplier contacted to arrange for removal of the power supply. Should you not have access to the contact number for the local electricity supplier, dial 999.

NEVER

⚠ Never Overload

⚠ Never alter the pressure setting of the relief (overload valve)

⚠ Never put the tipper lever in “tip” unless you are actually tipping

⚠ Never tip an uncoupled trailer

⚠ Never tip in high winds

⚠ Do not tip on unlevel or uneven ground

⚠ Never tip within 5 metres of overhead power lines

⚠ Never tamper with the pressure relief valve or end of stroke valve for cylinder.

⚠ Do not tip body until necessary and not higher than necessary to reduce the risk of overturning, sufficient to offload the contents and must never be fully extended with heavy loads.

⚠ The vehicle should never be driven in forward or reverse to shake the load free.

⚠ Entering the vehicle body to resolve is not permitted under any circumstances.

⚠ Never drive off with the body in the tipped position or with the PTO engaged. (PTO refers to rigid vehicles only)

⚠ Never leave the vehicle with the body in the tipped position.

⚠ Never leave the body up overnight

⚠ Never leave the tractor with the ignition key in.

⚠ Never go under a raised LOADED body

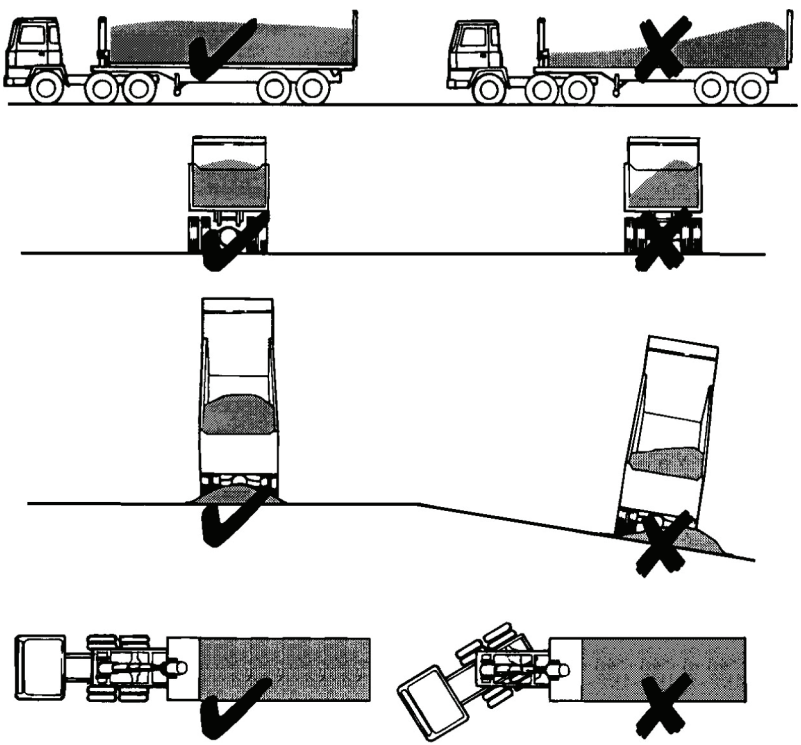
⚠ Never go under a raised EMPTY body (unless it is propped safely)

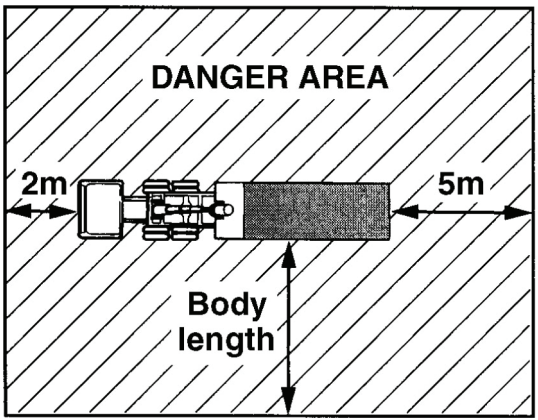
⚠ Never uncouple the trailer unless the body is down and the PTO is “out”

⚠ Never climb on any of the equipment by any means other than that provided by the manufacturer.

⚠ Never steam clean the exposed cylinder tubes, this will cause corrosion.

SAFETY CODE





Always ensure that no person, animal or other equipment is within this area when tipping

TIPPING

OPERATION - TRAILERS

OPERATING PRESSURE
Operating Pressure must only be operated up to a maximum pressure shown on the identification plate. Normally this is 150 bar (2,200 psi) but it may lower if there is a risk of buckling failure on long stroke hoists.
For further information regards Operating Pressure, please refer to the Edbro Operators Manual, see Pages 68 to 111 within this booklet.

CONTROLS - TRAILERS

The hoist is operated using hydraulics, gear pump, valves, oil tank, pipes and controls. The tipper controls are combined in a single unit and work off the vehicles air system (Type A and Type C). **Note Type B (Fig SD-2) is operated off the hydraulic circuit only.**

NOTE:
If your vehicle is fitted with stabiliser legs, please ensure these are down and in correct position before tipping.

TIPPING CONTROLS

TYPE A
FIG SD-1
located at rear near side

TYPE B
FIG SD-2
located at near side beside landing legs

TYPE C
FIG FR-1
located at front of vehicle

Vehicles are normally fitted with TYPE B. Some models are fitted with TYPE A and Type C Controls

OPERATION & SAFETY

HOW TO RAISE THE BODY

⚠ Ensure handbrake in tractor unit is secured.

⚠ Ensure keys are removed from ignition (tractor unit)

Fit equipment, hoses etc for delivery or unlock grain hatch as necessary.
(Please refer to Operational Instructions re Blowing Equipment Pages 31-34

⚠ Ensure safety checks have been carried out as detailed under SAFETY guidelines.

⚠ Ensure no one is in the DANGER AREA (See Page 22)

Open Air Relief Valve, see Figure SD-7

FIG SD-7

FIG SD-8

Start up Donkey Engine (See Fig Sd-8)

OPERATION & SAFETY

TIPPING

OPERATION - TRAILERS

For Tipping Control Type A (FIG SD-1) (used in combination with Tipping Control Type C (Fig FR-1))

This type of control is set for 2 stage tipping. Press the red RAISE button and hold in position to reach required level. The body will rise to Stage 1. If you find you need to tip higher, you must press the Tipping Override Switch located at front of trailer in Tipping Control Box C (Fig FR-1) to allow Stage 2 Tipping. Tipping then may continue by pressing the red RAISE button at the rear side of the trailer. This allows the operator to raise the body to a maximum of Stage 2 level.

To stop the body being raised at any time within each stage, simply remove pressure from button.

Only tip body to the second stage of tipping when it is absolutely necessary to do so. Operators should exercise great care whilst tipping at the second level.

Tipping Control Type A (Fig SD-1)

Located at Rear Off-Side of Vehicle

Tipping Control Type B
Fig SD-2

Located at Off-Side of Vehicle

Tipping Control Type B (FIG SD-1)

Tipping Control B consists of a lever with various safety features, it is spring loaded so it cannot be accidentally moved into “raise” or “lower” position. It will automatically return to the hold position when the operator removes their hand from the tipper controls.

Tipping Control Type C
Fig FR-1

Located at Front of Vehicle

Tipping Control Unit C (FIG FR-1)

This type of control can be used independently to raise the body or in conjunction with Tipping Control Type A (FIG SD-1)
Press the red RAISE button and hold in position to reach the required level. Tipping is set to operate in 2 stages. To continue to the next stage of tipping, the operator must press the Tipping Override Switch and begin next level tipping. The operator must repeat the process of precessing the Tipping Override Switch to progress to next level tipping for each stage.

TIPPING

OPERATION - TRAILERS

⚠ Raise the body SMOOTHLY by varying the engine revs but NEVER EXCEED 1500RPM

⚠ Do not tip body higher than necessary to reduce the risk of overturning, sufficient to offload the contents and must never be fully extended with heavy loads.

⚠ It may be necessary to tip the body slightly higher than normal operation with a new vehicle until the floor surface has become polished.

⚠ This must be done slowly and with extreme caution to avoid the vehicle becoming unstable.

After tipping, close Air Divert Valve.

OPERATORS SHOULD ALSO REFER TO TIPPING HOIST MANUFACTURERS OPERATOR MANUAL - SEE PAGES 68 TO 111

HOW TO LOWER THE BODY

⚠ Ensure safety checks have been carried out as detailed under SAFETY guidelines.

⚠ Make sure no-one is in the danger area (See Page 22) Then:

Tipping Control Type A (FIG Sd-1)
See Page 24

press the black LOWER button and hold in position. Releasing pressure on the button will stop the body lowering.

Tipping Control Type B (Fig Sd-2)
See Page 25

push the lever DOWNWARDS to LOWER and hold in position. Bringing the lever to the CENTRE or HOLD position will stop the body lowering.

Regulate the speed the body comes down by moving the lever towards “hold” to slow it down.

When body is down, move the lever back to hold.

Tipping Control C - FIG FR-1)
(See Page25)

press the black LOWER button and hold in position. Releasing pressure on the button will stop the body lowering.

If your vehicle is fitted with stabiliser legs, ensure these are raised before driving off.

CAUTION

⚠ **DO NOT DRIVE OFF UNTIL THE BODY IS FULLY DOWN.**

⚠ **Always wear Ear Defenders when operating equipment.**

OPERATION & SAFETY

LOADING PROCEDURE

There are various methods used to load your vehicle.

The most common methods are

1. Through specialist equipment fitted in mills which automatically releases product into the trailers various compartments.

2. Through use of a loading shovel.

Additionally, some vehicles may be fitted with a suction vacuum system.

Each individual loading venue will differ in operational set up and drivers should familiarise themselves and comply with Health and Safety Procedures as stipulated by the loading venue.

SAFETY CODE

⚠ Vehicles should be loaded in a safe location on firm level ground.

⚠ The load should be spread evenly within the body.

⚠ Ensure the surrounding area is clear of people and obstructions.

⚠ During loading, the driver should remain in the cab of the vehicle unless otherwise advised by the mill/ docks etc.

⚠ If the driver is required to leave the cab of the vehicle, they should remain clear of the vehicle whilst loading.

⚠ During Type 1 loading, the vehicle usually is required to drive forwards or reverse. Drive **VERY SLOWLY.**

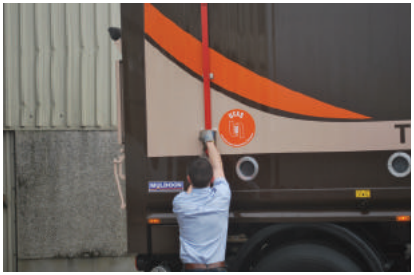
For type 1 and 2 loading (see above), the operator will be required to open the sheeting system prior to loading the vehicle.

TO OPEN SHEETING (VEHICLES WITH PLATFORM FITTED

⚠ Ensure front platform is cleaned to reduce risk of slipping.

⚠ Ensure safety rails are in good condition at all times.

⚠ Take extra care in extreme weather conditions, rain, wind, sleet, snow etc.



⚠ Always ensure you wear safety clothing including hi visibility jacket, clothing which is unlikely to catch on any part of the trailer, suitable boots with adequate grip etc.

EXTRA CAUTION - VEHICLES WITH CATWALK (WALKWAY)

We do not recommend getting on top of a trailer for any reason however some at the operators request may be fitted with a catwalk (walkway). We stress we do not advise this procedure, however advise the following safety precautions should be taken ...

⚠ If getting on top of the body is necessary, do so using the ladder and platform at the front and the catwalk fitted along the length of the body.

⚠ Always ensure the safety rail is up and secured before climbing on the catwalk.

⚠ Always wear a Safety Harness which must be clipped to the safety rail at all times.

TO OPEN SHEETING (VEHICLES WITHOUT PLATFORM FITTED)

Please refer to the manufacturers Individual Sheeting System Guidance as referred to in Annex 11 & Annex 12, See Pages112 to 113.

ALL TYPES OF SHEETING

Before opening the sheeting, check the ratchets for wear and tear and check sheeting is in good repair.

Ensure the sheet is opened according to the manufacturers guidelines and all handles etc are secured before loading.

EXTRA CAUTION

NEVER ENTER THE BODY WHILST LOADING

MODELS FITTED WITH DEMOUNTABLE VACUUM SYSTEM

Please refer to separate manual titled “Demountable Vacuum System Operation, Safety and Maintenance Manual”

UNLOADING PROCEDURE

Unloading the vehicle is carried out using various methods.

1. By use of the pneumatic discharge equipment (engine and blower powerpack) delivering via bulk delivery hoses.

2. By Bulk Tipping via the tailgate.

3. Bulk Tipping releasing product through the rear (grain) hatch.

SAFETY CODE ⚠

⚠ Enter farm yard/ delivery destination with extreme care. Be vigilant for people, farm animals, children, obstructions or obstacles.

⚠ Park in an area where there is no overhead cables within the Safety Zone referenced in Tipping Section

⚠ Ensure you have read and understood the Tipping SAFETY CODE, (See Pages 20-22 for details)

⚠ Always park on level ground

⚠ Turn on work lamps if dull or dark.

⚠ Ensure whilst tipping no one is within the danger area (See Page)

⚠ Ensure discharge point holding vessel has sufficient capacity for the load to be delivered.

⚠ Ensure no one stands or walks behind vehicle when body is being raised or during tipping.

⚠ Ensure if applicable the lift up axle is in the down position before raising body.

⚠ Ensure if applicable stabiliser legs are in correct position before tipping.

⚠ Under no circumstances should the driver or operator attempt to remove any blockages via the rear (grain) hatch unless the body is lowered and blower mechanism turned off and isolated.

⚠ Never enter the body.

⚠ Never use objects to keep tipping controls in a position. Driver should always remain at controls.

⚠ Whilst tipping, the driver should remain vigilant to signs of the vehicle toppling sideways. In this case, the process should be stopped immediately and the body lowered.

⚠ Never drive the vehicle forward whilst tipped to shake free a stuck load.

⚠ Ensure wire detection systems if fitted are in working order and appropriate action is taken if the system alerts you to the danger of wires.

⚠ Never put your hand in near the various auger or rotary seal whilst operating or any moving parts of the vehicle.

⚠ Whilst opening the tailgate to tip bulk loads, the operator should stand to the side of the vehicle if possible whilst opening door.

⚠ Some vehicles are fitted with an Kill Switch. If fitted, this can be pressed to completely isolate the vehicle, tipping, equipment etc.

⚠ After unloading, ensure all partition doors in trailer are secured and locked before driving.

⚠ Ensure body is fully down when delivery is complete.

VEHICLES FITTED WITH STABILISER LEGS

⚠ Vehicles fitted with the hydraulic stabiliser legs should not be tipped until the operator has levelled the vehicle to a level of less than 1 degree.

OPERATION

Please refer to the TIPPING and SAFE TIPPING sections (See Pages 20 to 26) as well as SAFETY CODE for Unloading. (See Page 29) before attempting to Unload the vehicle.

OPERATING INSTRUCTIONS

BULK TIPPING VIA TAIL DOOR

The tailgate should be released before tipping starts.

Bodies should be raised gradually to offload the contents.

The operator/ driver should ensure the load will be released smoothly and safety and will not jam.

If the load does not flow when the tipping angle is reached, tipping should be stopped and investigated.

BULK TIPPING VIA REAR (GRAIN) CHUTE

The chute should be in position unless it is absolutely necessary to remove. For example, a blockage occuring which can occassionally occur if the product granules are larger or of a certain consistency.

However, the rear (grain) chute should not be removed without the following precautions.

1. Lower the body
2. The engine and blower mechanism must be turned off and isolated.
3. Never attempt to remove the blockage using your hands.

The body should be raised gradually to off load the contents.

Ensure load is released smoothly and safely.

OPERATING INSTRUCTIONS

PNEUMATIC DISCHARGE EQUIPMENT

Refer to safety points in SAFE TIPPING and UNLOADING before attempting to unload the vehicle through use of the pneumatic discharge equipment.

OPERATING INSTRUCTIONS

PNEUMATIC DISCHARGE EQUIPMENT

Ensure the vehicle is situated in the correct position and location as detailed in the SAFETY GUIDELINES.

Ensure if applicable the lift axle is in the down position.

Check the vessel at the discharge point has enough capacity for the load to be discharged.

Remove the dust plug from coupling at rear of vehicle on whichever side is nearest to the discharge point.

Connect the delivery hose (or hoses) avoiding any sharp bends between the trailer and the holding vessel.

Ensure air relief valve is closed (FIg SD-7).

FIG SD-7

Start the Donkey Engine

FIG SD-8

FIG SD-8
For a more detailed view See Annex 1 page 58

Ensure butterfly valves (if fitted) are engaged in the proper direction.

CLOSED - NEAR SIDE

OPEN - OFF SIDE

Ensure DUST CAP on opposite side is secured in place.

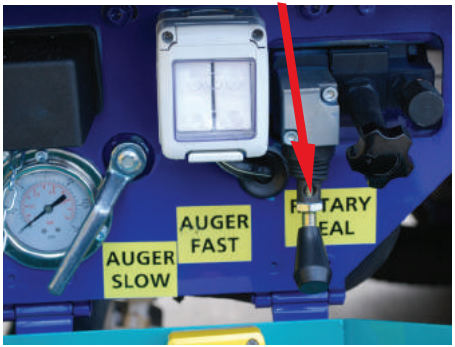
Ensure butterfly valve nearest discharge hose is in the closed position.

Ensure butterfly valve on the opposite side is in the open position.

Ensure air relief valve is in closed position.

Refer to Annex 14, Page 116-118 for Blower Operation Settings.

Engage Rotary Seal at rear.



Rotate adjustment knob in anti-clockwise direction to ensure rotary seal will rotate.

Turning the knob in a clockwise direction will decrease the speed or stop the rotary seal rotating.

Turning the knob in an anti-clockwise direction will increase speed and therefore blowing pressure.

The blowing pressure should be determined on a case by case basis depending on product and delivery site conditions.

See Annex 14, Page 116 for Operators Guidelines Blower Speeds & Operating Pressures.)

Turn back to off position when finished blowing.

Do not run the blower under conditions of high pressure at low speed, even for short periods.

If at any time the blower becomes excessively hot, if it sounds noisy or sounds harsh, blowing should be stopped immediately.

Keep at the recommended speeds. *(See ANNEX 14, Page 116 for manufacturer recommendations)*

During cold weather, check the inlet air filter and relief valve for free operation as both can become blocked with snow.

If blowing hoses become blocked when blowing, isolate the hydraulics by returning all controls to neutral, switch off engine and blower. Uncouple discharge hoses, shake as much material as possible from inside of discharge hoses, reconnect hoses and resume blowing as per operating instructions. If problem persists, report to your manager.

ADDITIONAL OPERATING INSTRUCTIONS

BACK DOOR SAFETY CUT OFF

A safety cut off is fitted to the rear of the vehicle to prevent injuries caused by the rotary seal and auger. If the rear door is opened, then the feeder and auger are disabled by a safety cut off switch.
If defected, contact your manager immediately.

Back Door Safety Cut Off

TAILDOOR

Do not operate tail door locking bars when the vehicle is tipped, only when body is in the down position.

ON COMPLETION

We recommend that on completion of delivery, the operator should continue to run the engine and blower at normal speed for 1 minute before powering off.

TRAILER - AUTO-DROP, LIFT UP AXLE AND ROLL STABILITY

Lift up axle, normal operation is completely automatic and weight sensitive.

When running whilst empty, the axle will be in the raised position and when running fully laden the axle will be in the down position.

When the trailer is part loaded, the axle may be in the raised or lowered position this will be dictated by weight and will only be raised when the weight is at a safe and legal limit for the remaining axles.

When additional traction or manuoevrability is required, release the handbrake and pump the brake pedal six times within 12 seconds, the lift up axle will raise and remain raised until the vehicle exceeds 30kph or the ignition in the tractor unit is turned off.

When the axle is raised and you would like to lower the axle manually, release the handbrake and pump the brake pedal 3 times within 12 seconds. The axle will then remain lowered until the tractor unit ignition is switched on and off to reset.

Where there is an additional traction help button fitted on the side of the trailer or in the tractor unit, press button once for traction help and the axle will remain raised until the vehicle exceeds a speed of 30 kph or the tractor unit ignition is switched off.

If an EBS light is illuminated in the vehicle dash and there is a fault present, the lift axle will not operate.

All trailers are fitted with roll stability which detects excessive body roll when driving and will apply the trailers brakes to reduce the vehicles speed to a safe level when cornering.

MULDOON SIDEWINDER POSITIVE REAR STEER SYSTEM

FOR INFORMATION REGARDING THE MULDOON "SIDEWINDER" POSITIVE REAR STEER SYSTEM, PLEASE REFER TO SEPARATE HANDBOOK, "MULDOON SIDEWINDER POSITIVE REAR STEER SYSTEM - OPERATION, SAFETY & MAINTENANCE MANUAL"

SIDEWINDER steering systems

TRAILER INFORMATION MODULE

The TIM (Trailer Information Module is a diagnostic and information unit that displays any current braking and suspension faults.
See separate Manufacturers Handbook relating to your Trailer Information Module.

AXLES & SUSPENSIONS

See separate Manufacturers Handbook supplied with your trailer relating to your specific Axle and Suspension type.

ON BOARD VEHICLE WEIGHING

See separate Manufacturers Handbook supplied with your trailer relating to your specific On Board Weighing System.

PARTITION DOORS & LOCKS

⚠ WARNING - Failure to operate partition locks in the correct manner could cause damage to the locks, result in load mixing, premature wear or personal injury.

Please ensure all partition doors are locked which are forward of the compartment to be discharged.
Failure to carry out this procedure will cause the locking bar to twist and result in the grains mixing from the various compartments.

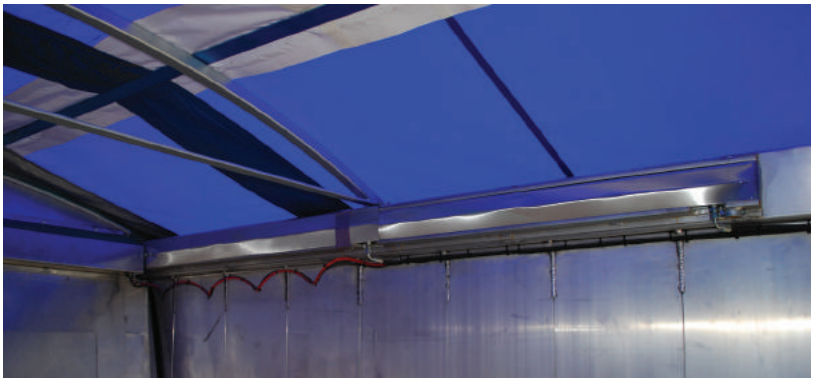
All partition doors should be locked when running empty. This prevents damage to the doors.

Do not operate position locking bars when the vehicle is tipped, doors should only be locked or opened when the body is in the down position. Doors should be opened using the tool provided.

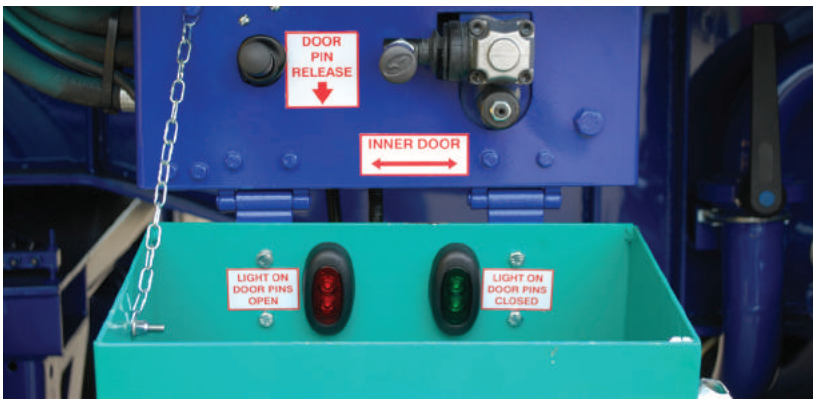
OPERATION & SAFETY

MULDOON TYPE AUTO DOOR

The Muldoon Type Auto Door allows the operator to move one or more internal dividing doors by the use of a control box on the outside of the trailer.



EXTERIOR CONTROL PANEL FOR MULDOON AUTO DOOR



CAUTION

⚠ Failure to move partition door in the correct manner could cause damage to the locks, result in load mixing, premature wear or personal injury.

⚠ Ensure all partition doors are locked which are forward of the dividing door to be moved.
Failure to carry out this procedure will cause the locking bar to twist and result in the products mixing from the various compartments.

⚠ **DO NOT MOVE INNER DOOR WHEN MATERIAL IS IN BODY**

⚠ Do not operate position locking bars when the vehicle is tipped, doors should only be locked or opened when the body is in the down position.

To operate moveable door, first, open door using tool provided.

Pull down lever for Door Pin Release (as shown in photo)

By pulling down the lever to release the pins, this releases the door from its locked position at the base to allow for movement.

Pin in locked position
(SEE RIGHT)
The control panel green light will be lit up when the pin is in the closed position.

Pin opened and door moved
(SEE RIGHT)
The control panel red light will be lit up when the pin is opened.

OPERATION & SAFETY

Muldoon Type Auto Door contd ....

When the pin is unlocked and red light is showing, it is now safe to use the lever to open the door.

Move the handle left or right to move door in the direction required.
See sticker on control panel.

The door will then move steadily into its new position.
When it reaches the next position, it will click into place and the door pin will automatically lock the door into position.
The Green Light will be illuminated on the control panel to indicate door is in the correct position.

Door needs to be locked at the top position of the door by using the tool provided to lock door. See photo below.

LIGHTING

LIGHTING

Working Lamps

The work lights are operated from waterproof switches usually located in the rear control box or on the inside of the chassis forward of the landing legs.

The work lights above tail door are operated from a waterproof switch located in the rear control box.

Work lamp mounted inside body is wired to a waterproof switch in the rear control box.

Work lamps located in hinged back panel are wired to work only when reverse gear is selected. There is no separate switch.

Work lamps located behind hose trays are wired to a waterproof switch on rear of offside hose tray. They are powered only when reverse gear is selected.

Work lamps mounted below the control panel and corresponding position on nearside are wired to a waterproof switch located in the rear control box

Exact position of work lamp switches and functions may vary depending on each companies individual specification. If not otherwise specified the above will apply.

Strobe Lights - Trailer

Rear strobe lights are wired to a waterproof switch located in the rear control box. These may also be wired to be operated from a switch in the cab. Pin 1 & 4 on the Auxiliary Suzie are usually used for these. This may be different depending on tractor unit.

Tractor unit strobe lights are switched separately from a switch located in the cab and identified with a beacon symbol. Exact position will vary depending on make and model of tractor unit.

On Board Vehicle Weighing Systems

NAPPER ON BOARD WEIGHER

Please refer to individual manufacturers manual contained within this booklet, (See annex 15, pages 118 to 132)

PM ON BOARD

Please refer to individual manufacturers Manual supplied separately with the vehicle.

Reversing Sensors

Please refer to individual manufacturers manual contained within this booklet, (See annex 16, pages 133 to 142)

Vehicle Video System (Reversing Cameras)

Please refer to individual manufacturers manual contained within this booklet, (See Annex 17, pages 143 to 144)

Wire Watcher System

Please refer to individual manufacturers manual contained within this booklet, (See annex 13, pages 114-115)

MULDOON TIP-SAFE Hydraulic Stabiliser Legs

The Muldoon Tip Safe Hydraulic Stabiliser Legs are fitted to some vehicles to provide safe tipping on uneven or unlevel ground.

⚠ Operator should find a safe place to park with firm ground. The ground may slope to a maximum of 4 degrees.

Operator simply uses the levers situated at the rear of the trailer to move the individual stabiliser leg to zero degrees for safe tipping.

There are 2 levers on the rear of the vehicle situated at the right and left hand side.

The operator adjusts the legs until the spirit level shows the trailer is level.

Before adjustment - 4 degrees

After adjustment - 0 degrees. This now indicates a safe level to begin tipping.

⚠ To ensure complete safety, the ECU in the trailer prevents tipping taking place unless the trailer is at a level of less than 1 degree.

⚠ A secondary warning light illuminates if the trailer is not level.

⚠ A safety lock ensures the legs cannot be moved whilst tipping is taking place.

⚠ Following tipping, legs must be raised fully. The brakes on the trailer will not disengage until the legs are fully raised.
The stabiliser legs may also be used for wheel changing, tyres etc or for mechanical procedures such as brake testing.

OPERATION & SAFETY

BREAKING IN YOUR VEHICLE

Moving parts should be allowed to break in. To ensure your vehicle provides maximum economy throughout a long service life, we advise the following:

Engine and Blower

Refer to your engine and blowers Manufacturers manual for guidelines but generally -

During the running-in period (first 50 hours of operation), the engine must be used with an absorbed load of between 50% and 70% of maximum power.

- Avoid using the engine at the highest speed for prolonged periods during running in.

Tyres

Due to technical factors associated with their manufacture, tyres do not achieve their full traction potential until after an initial break in period. Therefore, drive reservedly for the first 200 miles/ 300 km

Brake System

Brakes require an initial break in period of approx 300 miles/ 500 km to achieve optimal contact.

GENERAL DRIVING NOTES

Road Hazards

⚠ If road hazards, obstacles or kerbs are unavoidable, only drive over them very slowly and carefully, otherwise the wheels and suspension parts can become damaged.

Hydroplaning

⚠ When driving on wet or slushy roads, reduce road speeds. If you do not, a wedge of water can form between tires and road surface.This state can cause a partial or total loss of contact with the road surface, of braking control and control over the vehicle.

Driving through Water

⚠ Do not drive through water on the road if it is deeper than 20 inches, (50 cm) at walking speed at most. Otherwise the vehicles engine, blower and electrical systems may be damaged.

On Poor Roads

When you are driving on poor roads, there are a few points you should strictly observe - for your own safety, safety of passengers, other road users and to the vehicle.

⚠ Driving on bad terrain can cause damage to the vehicle.

Always adapt your driving speed to suit the road conditions. The rougher or steeper the road surface is, the lower your speed should be.

Whilst driving, watch out for obstacles such as rocks or holes. Try to avoid these obstacles whenever possible.

After driving over bad terrain, it is our recommendation to check your vehicle in order to maintain safety.

- Clean the worst of the dirt from the undercarriage of the vehicle and inspect for damage.

- Clean mud, snow, ice etc from the wheels and tyres and check the wheels for damage.

- Check to determine whether rocks, gravel or accumulations of dirt on the brakes could influence braking performance. Clean as necessary.

SAFE BRAKING

For information regarding Safety and Maintenance Instructions for Braking, please refer to your axle/ suspension handbook (Provided separately with the vehicle)

TYRE INFLATION PRESSURE

Tyre Inflation Pressure will vary according to tyre size and manufacturer. Please refer to manufacturers guidelines as to the correct pressures to be used. This information may be provided on the actual tyre.

The condition of the tyres and the maintenance of the specified tyre pressure are crucial not only to the tyre's service life but also to driving comfort and most importantly, safety of your vehicle.

Checking Pressure

Only check tyre inflation pressure when the tyres are cold. This means less than a maximum of 1.25km miles/ 2 km driving or when the vehicle has been parked for more than 2 hours. When tyres are warm, tyre inflation pressure increases.

Check tyre pressures daily and correct if needed including spare wheel.

⚠ Driving with incorrect tyre pressures can compromise your vehicle's driving stability but can also lead to tyre damage and increased possibility of an accident. Do not drive with deflated (flat) tyres.

Attempts to drive with a deflated tyre can lead to loss of control over the vehicle.

Checking Tyre Wear

Check your tyres for signs of wear, damage and foreign objects stuck in tread etc. Check the tread depth.
Tyre damage extending to sudden loss of pressure in extreme cases can pose a potentially severe safety hazard.

MAINTENANCE

The recommended Muldoon Maintenance System helps maintain the road and driving safety of your vehicle.

Please bear in mind that regular maintenance is not only necessary for the safety of your vehicle, but plays a significant role in the resale value of your vehicle.

DOING IT YOUR WAY

We recognise that there are different methods and systems from those that are described within this guide that can result in vehicles maintained in a roadworthy condition.
If you are an operator who wishes to adopt a different system, you must still satisfy Muldoon that the system you use is effective.

KEY POINTS OF A GOOD MAINTENANCE SYSTEM

1. A responsible person must undertake a daily walkaround check, preferably immediately before the vehicle is used.

2. First use inspections are essential for operators who lease, hire or borrow vehicles. These are especially important where vehicles and trailers have been off the road for some time.

3. Drivers must be able to report promptly any defects or symptoms of defects that could adversely affect the safe operation of vehicles. Reports must be recorded and provision should be made to record details of any rectification work done.

4. Drivers' defect reports, used to record any faults, must be kept for at least 15 months.

5. Operators must ensure that regular checks are carried out on items that may affect roadworthiness.

6. Safety inspections must include those items covered by the appropriate DVA or DVLA annual test.

7. Safety inspections should be pre-planned, preferably using a time based programme.

8. The system of safety inspections must be regularly monitored, especially in the early stages.

9. Any remedial work carried out as a result of safety inspections must be recorded.

10. The safety inspection must include:
    - name of owner/ operator
    - date of inspection
    - vehicle identity
    - odometer (mileage recorder) reading, if appropriate
    - a list of all the items to be inspected
    - details of any defects
    - name of inspector
    - details of any remedial/ rectification or repair work and by whom it was done
    - statement that any defects have been repaired satisfactorily

11. On some types of vehicles and

operations, intermediate safety checks may be necessary.

12. Records of safety inspections must be kept for at least 15 months.

13. Staff carrying out safety inspections must be competent to assess the significance of defects. Assistance must be available to operate the vehicle controls as necessary.

14. There must be an internal system to ensure that unroadworthy vehicles are removed from service.

15. Operators who undertake their own safety inspections must have the correct tools and facilities for the type of vehicle operated.

16. All operators must have access to a means of measuring brake efficiency and exhaust emissions.

17. Operators are responsible for the condition of trailers that are inspected and/ or maintained by them by agents, contractors or hire companies.

18. Operators who have contracted out their safety inspections must draw up a formal written contract with an inspection agency or garage. Such operators should have a means of regularly monitoring the quality of work produced for them.

19. The dates when safety inspections are due must be the subject of forward planning. A maintenance planner or wall chart should be used to identify inspection dates at least 6 months before they are due. Computer based systems are equally acceptable.

20. Any system of maintaining roadworthiness of vehicles should be effectively and continually monitored.

21. Drivers must be given clear written instructions about their responsibilities.

RESPONSIBILITIES FOR ROADWORTHINESS

As an operator/ driver of a vehicle, it is **your responsibility** to ensure that the vehicle you use is roadworthy. **It is an offence to use an unroadworthy vehicle on the road.**

The user of a towing vehicle is responsible for the roadworthiness of a trailer even if it does not belong to them.

ROADWORTHINESS INSPECTIONS

When it comes to ensuring the roadworthiness of a vehicle, there are two types of essential inspections. Each type is used for a different purpose and requires different levels of skill to be carried out effectively.

1. DAILY WALKAROUND

2. REGULAR SAFETY INSPECTIONS

These inspections should not be confused with a service. A service contains items requiring routine maintenance determined by vehicle usage and recommendations.

MAINTENANCE

DAILY WALKAROUND CHECKS AND FIRST USE INSPECTIONS

This section looks at the two essential roadworthiness inspections, the daily walkaround check and first use inspection. It offers the best practical adviceon setting up a system for reporting faults and looks at defect reports.

A responsible person must undertake a daily walkaround check before a vehicle is used. As a driver, you may carry out the check before you drive the vehicle on the road each day.

Assistance may be required at some time during the inspection, for example to see that lights are working. Alternatively, a brake pedal application tool may be used as an effective way of making sure stop lamps are working and that the braking system is free of leaks. In addition, a torch, panel lock key or other equipment may be needed.

SYSTEM OF REPORTING & RECORDING FAULTS

The person made responsible by the operator should carry out a minimum of one check in a 24 hour period. The check should consist of a walkaround look over the whole vehicle or combination. On multi trailer operations, a defect check should be made on each trailer being used. The check should cover the external condition ensuring in particular that the lights, tyres, wheel fixings, bodywork, trailer coupling, load and anciallary equipment are serviceable.

There must be a system of reporting and recording faults that may affect the roadworthiness of the vehicle and having put right before the vehicle is used.

Daily defect checks are vital and the results of such checks should be recorded.

It is important that enough time is allowed for the completion of these checks and that staff are encouraged and trained to carry them out thoroughly. Drivers should be made aware that daily defect reporting is one of the critical elements of any effective vehicle roadworthiness system. If you are the user of the vehicle, it is your responsibility to ensure that any hired, leased or borrowed vehicle is in a roadworthy condition and has all the necessary certification when used on the road.
Therefore, it is essential that you do a daily walkaround check (as described above) before using the vehicle.
It is your responsibility to be able to provide maintenance records covering the period of use. Furthermore, if a vehicle has been off the road for a period longer than the planned maintenance inspections, it should be given a full safety inspection (See Section 4) prior to being brought back into use.

DRIVER DEFECT REPORTS

As the driver, you are responsible for the condition of your vehicle when in use on the road.

Drivers must be able to report any defects or symptoms of defects that could prevent the safe operation of the vehicle(s). In addition to daily checks, you must monitor the roadworthiness of

your vehicle when being driven and be alert to any indication that the vehicle is developing a fault (eg. warning lights, exhaust emitting too much smoke, vibrations) or other symptoms.

When a vehicle is on site work, you should walk around the vehicle to identify any serious defects. If any defects are found, you must not use the vehicle on the road until it is repaired.

PROVIDING A WRITTEN REPORT

Any defects found during the daily check, while the vehicle is in use or on its return to base **must be the subject of a written report** by you or some other person responsible for recording defects.
The details recorded should include:

a. Vehicle chassis number
b. Date
c. Details of the defects or symptoms.
d. The reporters name

It is common practice to use a composite form that also includes a list of the items checked every day. It is advisable that where practicable the system should incorporate "Nil" reporting when each driver makes out a report sheet - or confirms by another means that a daily check has been carried out and no defects found.
Electronic records of reported defects are acceptable and must be available for 15 months along with any record of repair.

APPROPRIATE ACTION

All drivers' defect reports must be given to a responsible person with sufficient authority to ensure that any appropriate action is taken. This might include taking the vehicle out of service. Any report listing defects is part of the vehicles maintenance record and must be kept, together with details of the remedial action for at least 15 months.

"Nil" defect reports, if they are produced, should be kept for as long as they are useful. Normally, this is until the next one is received or until the next scheduled safety inspection is undertaken. "Nil" defect reports are not required under the conditions of operator licensing. However, they are useful means of checking that drivers are carrying out their duties in this respect.

If you are an owner/ driver, you will probably not have anyone to report defects to, except possibly to your transport manager. In these cases, defects can simply be recorded and held for at least 15 months.

DRIVERS RESPONSIBILITIES

Drivers must be made aware of their legal responsibilities regarding vehicle condition and the procedure for reporting defects. This should be clearly understood by the driver, we advise all drivers receive a letter outlining the defect reporting system as well as any other duties they are expected to perform which is signed by the driver.
Drivers share responsibility of roadworthiness with the operator.

Drivers may be prosecuted for the existence of defects found on the vehicles they drive if they are considered partly or wholly responsible for the existence of them. Failure to take these responsibilities seriously could result in loss of the

drivers licence.

MINOR REPAIRS BY DRIVERS

If you are an operator, you should bear in mind that drivers who are expected to repair minor defects in service, eg. light bulb replacement, might need basic training.

FOR AN EXAMPLE OF A DRIVER'S VEHICLE DEFECT REPORT, SEE ANNEX 18, PAGE 45 WITHIN THIS MANUAL

EXAMPLE OF A DRIVERS DAILY CHECKLIST

FUEL/ OIL / WATER LEVELS
FUEL/ OIL / WATER LEAKS
CHECK BLOWER, DRIVE, RELIEF VALVE, FILTER ETC.
BE VIGILANT FOR EXCESSIVE ENGINE BLOWER NOISE OR SMOKE
LIGHTS - INDICATORS - REFLECTORS - MARKERS
BRAKES AND BRAKE LINES
BATTERY SECURITY (CONDITION)
COUPLING SECURITY
TYRE PRESSURES
TYRES AND WHEEL FIXINGS
ELECTRICAL CONNECTIONS
SPRAY FLAPS
SECURITY OF BODY / WINGS / FITTINGS ETC
COVER/ SHEET (Inspect for wear/ damage. Check tension straps daily for wear)
WIPERS / WASHERS
STEERING
HORN
MIRRORS
GLASS
SECURITY OF LOAD
TIP-SAFE STABILISER LEGS (If fitted)
MULDOON AUTO DOOR(S) (if fitted)

REGULAR OPERATION AND SAFETY INSPECTIONS

Regular safety inspections are essential to an effective roadworthiness maintenance system.
Although a part of the overall vehicle maintenance plan, the inspections should ideally be undertaken as a maintenance programme with the flexibility to intensify or otherwise change the frequency of inspections

Being Cost Effective

Although primarily undertaken in the interest of safe vehicle operation, roadworthiness inspections, together with prompt remedial action are also cost effective. The early indication of wear, damage or maladjustment may prevent sudden failure of a component - resulting in unscheduled downtime - or prevent wear becoming so advanced that premature replacement becomes necessary. New vehicles entering service that have undergone a recorded pre-delivery inspection will not require a safety insection provided that it is comprehensive. Used vehicles, not previously operated, should be given a full safety inspection.

Inspection Scope And Content

A roadworthiness inspection can be a freestanding inspection of just those items affecting road safety and certain environmental issues. Or it can be part of a more comprehensive inspection that, in addition, takes into account items relating to the vehicle's work performance and economic operation.

We recommend that all blowing and ancillary equipment is checked and serviced at this stage.

Reference should be made to manufacturers' recommend tolerances to ensure that each item is covered by the safety inspection is inspected properly and limits of wear and tolerance adhered to.

A roadworthiness safety inspection must include all the items covered by the statutory annual test.

SAFETY INSPECTION INTERVALS

There are no set rules for inspection intervals but operational needs must no over-ride safety considerations.

Safety inspections should, where it is practicable, be programmed to follow a time-based pattern. The frequency at which inspections are undertaken should be determined by assessing the level of mechanical degradation likely to be incurred over a period of vehicle's usage. This will depend on such factors as:

- The nature of its load and the equipment and fittings it carries or supports
- The type and range of operations on which it is likely to be engaged
- The type of terrain and the nature of the environment in which it operates
- The distance and speeds at which it travels and journey times.

Assessing the above factors will in the majority of cases enable a time based

programme of inspections to be formulated. Some operations, however are subject to continuous change, or vehicles can frequently be re-assigned alternative tasks or routes, making the adoption of a strictly time based inspection programme impracticable. Mileage based inspection programmes therefore may be more suitable for some operators but will need to be linked to time.

The resulting intervals in time between mileage based inspections will need to be consistent with the guidance in Annex 20 (Page 147)

Adapting Your Systems

If you are an operator, you are free to tailor these inspections to suit the nature of your operations and vehicle characteristics. The system will be judged primarily on their effectiveness in maintaining roadworthiness.

It follows therefore that in order to maintain and inspection regime that is sufficiently flexible to accommodate these changing criteria it might be more appropriate to adopt an inspection frequency determined by, for instance, the vehicles mileage.

Safety Inspection Report Forms

A written report must be completed for each safety inspection. If the record of the safety inspection is to be stored electronically, then the checklist used for the inspection need not be retained.

Each report should show the following ...

- Name of owner/ operator
- Date of inspection
- Vehicle identity
- Odometer (mileage recorder) reading if appropriate
- A list of all times to be inspected
- An indication of the condition of each item inspected
- Details of any defects found
- Name of inspector
- Details of any remedial/ rectification or repair work and by whom it was done; and
- A statement that any defects have been repaired satisfactorily.

An example of suitable safety inspection report forms are given in Annex 21, Pages 149-151
Intermediate Safety Checks

It may be necessary to check some components more often than at full safety inspections. For example, a vehicle used in urban areas, or vehicles used in hilly areas may require a weekly brake component and adjustment check together with a steering and suspension inspection. It is sometimes necessary to check components following repair work.

Ad hoc Safety Inspection Intervals

Safety inspections may be needed at times outside the scheduled programme. Examples include when the vehicle is used for harder work or covers greater distances than usual.

Safety Inspection and Repair Work Records, whether undertaken by operators or contracted out, must be kept a minimum of 15 months as part of the vehicles maintenance history.

Operators must ensure that the records

in the event of a claim for warranty are available, or can be made available on request. If you hire, lease or borrow the vehicle, you are responsible for its roadworthiness and must have available copies of any inspections carried out whilst the vehicle is in your possession.

Safety Inspectors

A person undertaking safety inspections must be technically competent and operationally aware of the safety standards that apply to the vehicles they examine.
Work should be carried out by Muldoon or at a Muldoon approved Service Centre.

Removing vehicle from Service

You must ensure that if the vehicle is not fit for service, it is taken off the road until it is serviced.

Vehicle Cleanliness

It is important your vehicle is kept clean, top, inside and underneath. This will **make it easier to spot defects** at scheduled safety inspections and during the daily walkaround checks.

NOTE
We have included labelled drawings of Muldoon Pneumatic Discharge Equipment & Muldoon Blowing Pipework, See (Annex 6, Pge 65 and Annex 7, Pges 66-67). We also have detailed photos at beginning of manual, See Pages 10-19

SAFETY INSPECTION AND REPAIR FACILITIES

Muldoon recommend the use of an approved Muldoon Service Facility only.

If you decide to provide your own safety inspection facilities, **you must ensure that they are adequate for the job.** Facilities should ideally include:

- Undercover area to ensure safety checks are carried out satisfactorily in all weathers.
- Tools and equipment appropriate to the size and nature of the fleet
- An adequate under vehicle inspection facility. Ramps, pits or hoists may be needed
- Adequate lighting
- Access to brake test equipment
- Access to engine exhaust emission test equipment
- Access to steam or pressure under-vehicle washing facilities

MAINTENANCE

Other requirements

A diesel engine smoke meter should be used to ensure that the level of exhaust smoke is within legal requirements.

Operators should also have access to a brake tester to check brake efficiency. The use of a roller brake tester is strongly advised.
A roller brake test is an important indicator of braking efficiency, although not a substitute for regular and proper maintenance.

Roadworthiness inspections can be included in an operator's overall maintenance plan.

Contracted-out Arrangements

If you decide to use a contractor, you are still responsible for the condition of your vehicle.

Key information
Care must be taken to ensure that the facilities used by the agent are adequate and that the staff are comptetent. You should also ensure of an inspection manual and has suitable inspection sheets. of an inspection manual and has suitable inspection sheets.

Drawing up contract
It is essential to have a written contract that sets out precise details of cover and frequency and type of check along with repair policy.

Contract limitations
Even when a maintenance contract exists between you (the operator) and an agent, **you remain responsible for the condition for the vehicle,** the authorisation of any report work undertaken and the retention of records.

You need to be satisfied at all times that the level of maintenance agreed matches the demands placed upon the vehicle and that standards achieved by the contractor **are kept at a sufficiently high level.**

You should therefore discuss regularly with the contractor to ensure they are familiar with the operational needs of the vehicle.
You should have a system for regularly monitoring the quality of the work done.

Any sign of unreliability, incompetence or other shortcomings causing a reduction in the standards achieved should receive prompt attention.

Visiting agents
As an operator, you may employ a visiting agent to undertake safety inspections, repairs and routine maintenance. However, you should ensure that the agent is qualified to work on this type of vehicle and that adequate tools and facilities are provided.
As in the case for contracted out arrangements, **you are responsible for vehicle condition and upkeep of records.**

Roadside safety inspections
Only emergency repairs may be done at the roadside. Routine maintenance, including safety inspections and repairs **may not** be carried out the public highway.

Planning a safety inspection programme

Safety inspections must be planned in advance.

A simple method of drawing up a programme is to use a year planner or flow chart.
An example can be found in Annex 19, (page 146). Computer based systems are equally acceptable, and the numerous electronic vehicle maintenance record management and storage systems available will often incorporate an electronic planning feature.

The information, w**hich should be kept in the simplest form possible and displayed prominently,** will serve as a reminder of programmed inspections of any changes that have been necessary.

Ideally, planners or chats should be used to set safety inspection dates at least 6 months in advance. Vehicles annual test dates should be included, as should servicing and other ancillary equipment testing.

The planner should be updated regularly by indicating the progress of the programme and recording any extra work carried out.
Vehicles that have been taken off the operators licence of vehicles temporarily off road should have their period of non use identified.

The planner may also be used to record other items in the vehicle maintenance programme such as servicing, unscheduled work and refurbishing.

EXAMPLE OF A SAFETY INSPECTION RECORD

See our recommended safety inspection record sheet, Annex 21, pages 149-151 within this manual.

MONITORING

This section examines why the importance of continuous reviewing and monitoring of hte quality of safety inspections is essential for all systems for maintaining a vehicle's roadworthiness. Continuous reviewing and monitoring of the quality of the systems in place is essential to ensure they are sufficiently comprehensive to do the job.
One method of monitoring is to invite a technically competent third party periodically to re-inspect or undertake a safety inspection irrespective of whether inspections are done in house or contracted out. The content of completed inspection reports can also be analysed. Checks should reveal any incomplete records and may also show patterns of faults. If many faults are reported regularly, this could indicate that

- there are not enough inspections
- daily walkaround inspections are not being completed correctly; or
- defects are not being corrected promptly or effectively.

MAINTENANCE

If no defects or few defects are reported regularly, safety inspection intervals may be too short or the quality of the inspection may not be good enough.
Effective monitoring will enable you, the operator to adjust the intervals between safety inspections to suit the operation of vehicles. In this respect, there is considerable flexibility provided within the framework of this guide.

Annual test results
Attention should also be paid to annual test results and the issue of prohibitions and inspection notices. Regular monitoring of all available information will enable you to check the effectiveness of your system in keeping your vehicle roadworthy.

British standards (if applicable)
British Standard BS EN ISO 9000 is a standard for quality management systems. If you are an operator who has been awarded this standard, you must observe systems of working set out in a quality manual. Such a manual would contain details of the organisation of the business, repsponsibilities of staff and methods of operation. Those businesses aiming for BS EN ISO 9000 accreditation would need to consider the training, documentation recording, planning, standards and monitoring aspects of their organisation.

MAINTENACE GUIDE - EQUIPMENT CHECKLIST

- Tipping Gear including hydraulic ram, brackets, hinge bar, bushes, fittings and hoses.
- Engine/ Blower assembly and system including engine, blower, drive assembly, hydraulic pump, engine electrics, pipework and valves.
- Rotary Valve, bottom Pan, auger, control valves, motors and all hydraulics and fittings.
- Complete hydraulic system, pipework and fittings.
- Hydraulic tank, diesel tank, battery box, tool box, hosetrays and all accessories and fittings.
- Lights and wiring.
- Wheels and tyres.
- Axle and suspension assembly and components.

- EBS/ ABS, braking valves, piping and wiring.
- Chassis mainframe assembly.
- Alloy body and equipment including dividing doors, locking cams, catwalks/ walkways (if fitted), cover, windows, taildoor, back panel and fittings.
- Steering system, components and fittings. (if fitted)
- Feed hoses and couplings.
- Stabiliser Legs (if fitted)

MAINTENACE SCHEDULE - GENERAL GUIDE

We recommend the following maintenance schedule as a guide only. Operators should take into consideration the individual vehicles type of work, usage, type of product being discharged, road conditions etc and adjust the schedule to suit.

Axles and Suspensions
Please refer to operators guide.

Tipping Ram
Please refer to operators guide within this manual, See Annex 8,9 & 10, Pages 68-111.

Engine
Please refer to operators guide.

Blower
Please refer to operators guide.

Muldoon Positive Rear Steer System
Please refer to operators guide.

Daily:

Please carry out checks as listed on Page 48, DRIVERS DAILY CHECKLIST

Weekly:

Check:

Hydraulics - Check hydraulic oil level and replenish as required.

Blower - Check oil levels, replenish as necessary. Check bearings for grease if applicable.

Blower Air Intake Filters - Remove and check elements, replace or clean. Wash removed units and dry completely.

Hydraulic Safety Cut Off Device - This should be checked for safe operation as often as possible but never left unchecked for any longer than a one week period. The switch should be kept clean.
The valve could be hydraulic, air or electric.

Rotary Valve Drive - Check oil levels where applicable and replenish as required.

MAINTENANCE

Grain Hatch - Check grain hatch is fitted on and locked.

Sheet/ Cover - Check for signs of wear and tear, check tension straps.

Back Door Cut off Valve - To check this is working correctly, turn auger on and check auger is working. Then open taildoor. If clamps are fitted, undo, then undo ringlet from locking bar.

CAUTION - Do not enter body or insert hands etc into auger whilst the equipment is working or whilst the rear door is open.

Open taildoor. The auger should have stopped working. If you find the auger is still functioning, report this to your manager.

The following should be greased once weekly :

- Tipping ram brackets and body brackets
- Steering system (if applicable, see operators manual)• Blower (See manufacturers guide)
- Tipping hinge bar and brackets
- Auger bearings
- Rotary seal
- Reduction gearbox extension shaft
- Outer S cam bushes (Drum Brakes)
- Inner S cam bushes (Drum Brakes)
- Brake slack adjusters (Drum Brakes)

MONTHLY

Blower Drive - Check flexible coupling. Grease drive end bearings.

Air Pressure Relief Valve - Check air pressure relief valve for operation. Report if valve lifts at pressure higher than 13 psi or inoperable.

Hydraulic Piping - Check all flexible hose and connections for oil leaks.

Air Trunking - Check air trunking, flexible hoses and joints for air leaks.

Hydraulic Valves - Check oil seals on selector valves, motors, flow control valve and tipping gear valve. Report any leaks immediately. Check hydraulic slide ram for leaks and report as necessary.

Auger - Check for wear, check sprockets, grease as required.

Rotary Valve - Check rotation is progressive and smooth as speed is increased.

Hydraulic Safety Cut Off Device - Check operation of hydraulic cut off valve. Open the tail door and check equipment, auger and feeder stop operating immediately.

Check bolts on blower, propshaft, rotary valve, drive and auger drive are secure. Tighten if required.

Sheeting System - Electric, check oil level. Check , clean and lubricate ratchets on side of body. Clean and

lubricate the universal joint on the rear winding handle. Check for signs of wear. Check manufacturers guide, See Annex 11 & 12, Pages 112-113

Tipping Ram
Please refer to operators guide within this manual, Annex 8,9 & 10 Pages 68-111

Axles and Suspensions
Please refer to operators guide.

Engine
Please refer to operators guide.

Blower
Please refer to operators guide.

Muldoon Positive Rear Steer System
Please refer to operators guide.

EVERY 3 MONTHS

Change Blower Air Intake Filters

Change Hydraulic Oil Filter Element

Engine and Oil Filters - See Manufacturers Guide

Tipping Ram
Please refer to operators guide within this manual, Annex 8, 9 &10, Pages 68-111

Axles and Suspensions
Please refer to operators guide.

Engine
Please refer to operators guide.

Blower
Please refer to operators guide.

Muldoon Positive Rear Steer System
Please refer to operators guide.

YEARLY

Tipping Ram
Please refer to operators guide within this manual, Annex 8, 9 & 10, Pages 68-111

Axles and Suspensions
Please refer to operators guide.

Engine
Please refer to operators guide.

Blower
Please refer to operators guide.

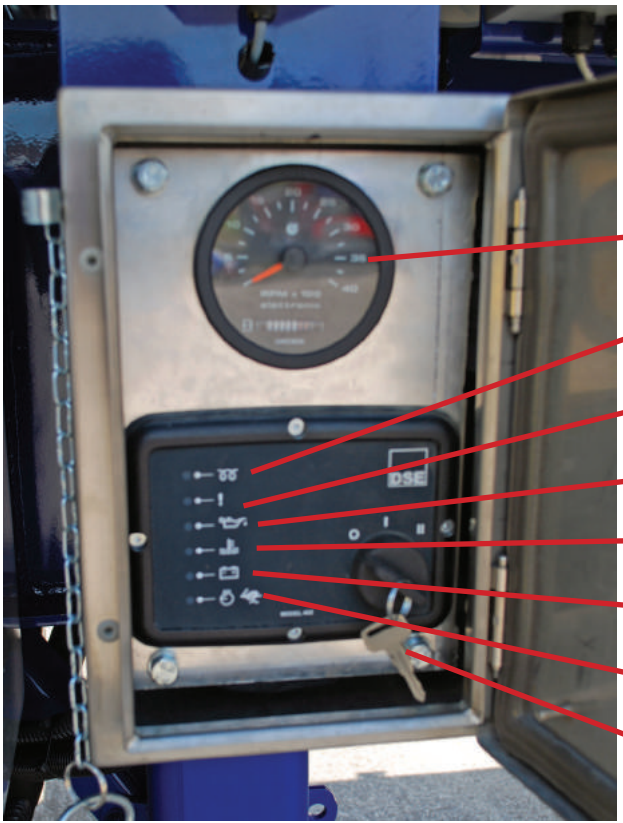
Muldoon Positive Rear Steer System
Please refer to operators guide.

NOTE:

Faults, breakages or damage occurring in the interim period should be notified to management and arrangements made for repairs to be carried out at the earliest opportunity. This will reduce the risk for any potential injury or accident. It also will reduce extra repairs required and expense in the long term and prolong the life of the vehicle and associated equipment.

Only use recommended oils and lubricants as recommended by the manufacturer.

ANNEX 1



DEEP SEA CONTROL PANEL
FIG SD-8

A. Rev counter & hour meter

B. Heater light

C. Steering hydraulic system fault

D. Oil pressure

E. Engine temperature

F. Charging light

G. Engine over speed

H. Ignition/ Stop

Tipping Control Type A
SD-1
Located at rear near
side of trailer

Controls contained within unit on front of trailer. See closed unit (photo above) and controls contained inside (photo right)

Tipping Control Type C FR-1
Located at front of trailer

ANNEX 3

Tipping Control Type B
SD-2
Located at centre near side of trailer

ANNEX 4 SAFETY WARNING SIGNS

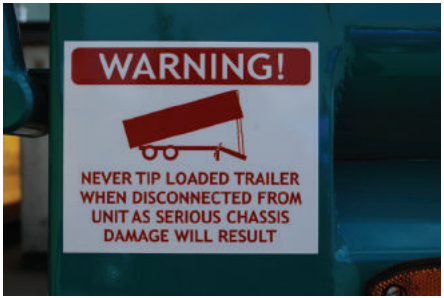


Fig 1 - Never Tip loaded trailer when disconnected from unit as serious chassis damage will result (Tipping) *(Located Rear Offside of trailer)*

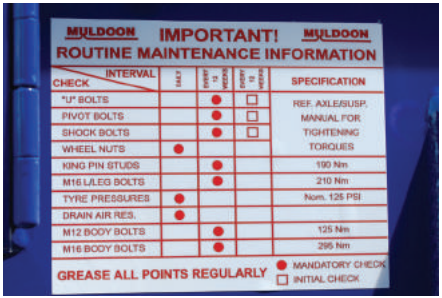


Fig 2 - Muldoon Routine Maintenance Information (Maintenance) *(Located front of trailer)*

Fig 3 - Ensure door pins are released and cam locks open before moving inner door (Moving Inner Doors) *(Located off side of trailer)*

Fig 4 - Do not pressure wash this junction box (On Board Weighing System) *(Located in centre front of chassis and on Weigher Control Panel - Vehicle Off Side)*

Fig 5 - Do not enter body while blowing equipment is in operation *(Located on rear door of trailer)*

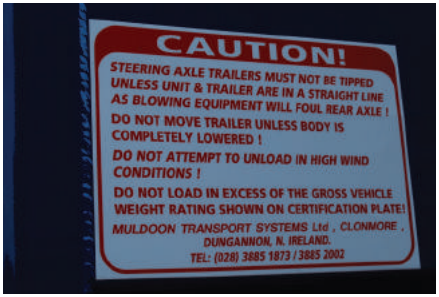


Fig 6 - Steering Axle Trailers - Safety Guidelines *(Located on front of trailer)*

Fig 7 - Ear Defender Badge
Ear defenders must be worn *(Located at off side of trailer)*

Fig 8 - Body Up Light
Warns when vehicle is tipped *(Located at front of vehicle)*

Fig 9 - Keep Clear of Unpropped Body
(Located on chassis at front of vehicle and also on both sides of chassis)

Fig 10 - Wire Watcher Warning Light Located on toolbox - *(Located on Off Side of Vehicle)*

Fig 11 - Trailer Electronic Braking System - Warning Trailer must be powered via ISO7638 Electric Connector *(Located on front of trailer)*

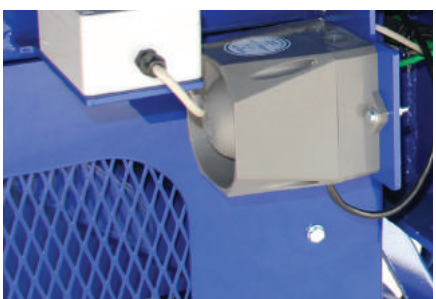


Fig 12 -Beware of Overhead Cables
Located on off side of trailer)

ANNEX 5 SIGNAGE - OTHER

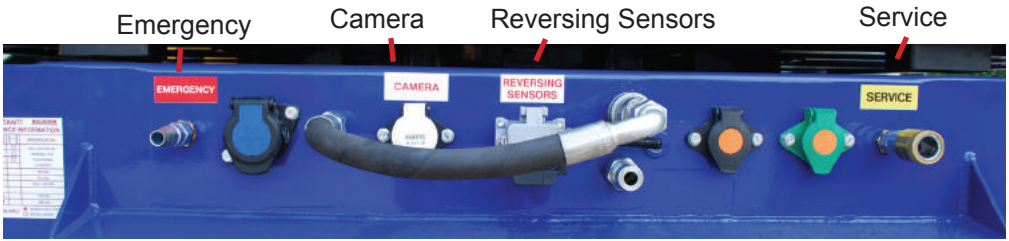


Fig 13 - Other *(Located Front of trailer)*

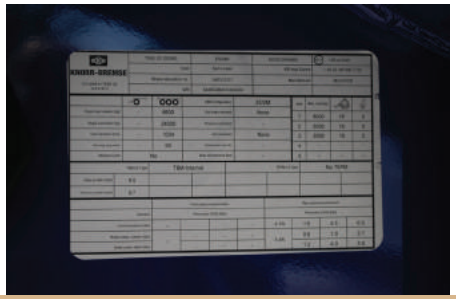


Fig 14 - Knorr-Bremse Information Plaque *(Located on chassis Near Side of Vehicle)*

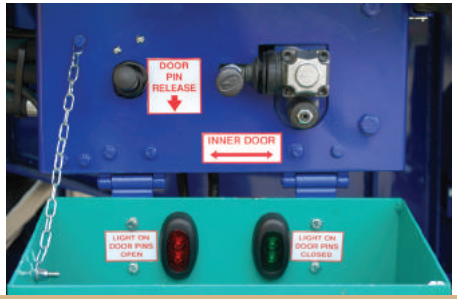


Fig 15 - Muldoon Auto Door Control Panel *(Located Off Side of Vehicle)*

Fig 16 - Internal Doors Open | Close Mechanism *(Located Off Side of Vehicle)*

Fig 17 - Auger and Rotary Seal
(Located Off Side of Vehicle)

Fig 18 - Diesel Tank
(Located Near Side of Vehicle)

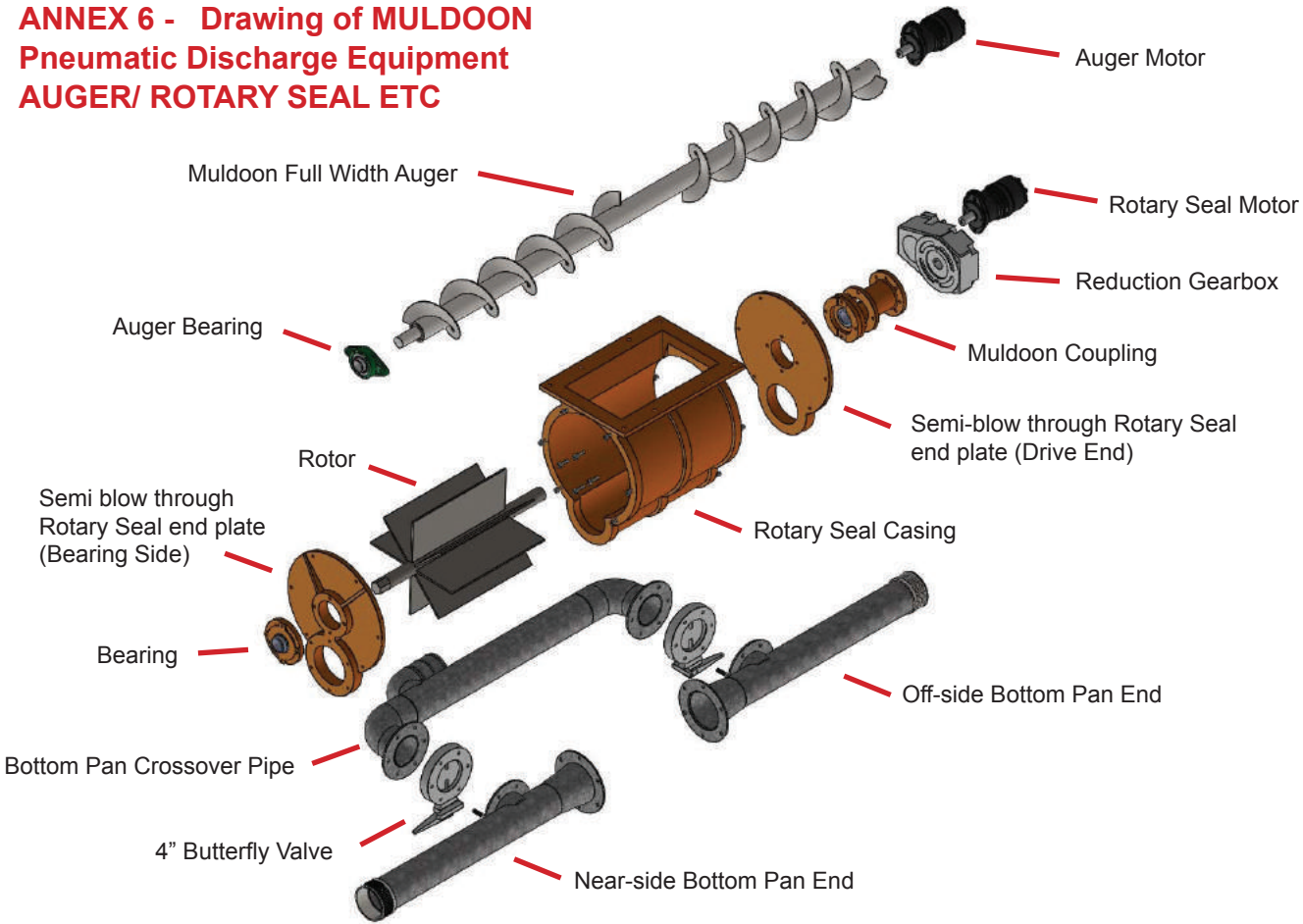
Fig 19 - Hydraulic Oil Tank
(Located Near Side of Vehicle)

Fig 20 - Vehicle Chassis Plate
(Located Near Side of Vehicle)

Fig 21 - Wire Watcher Control Box
(Located Near Side of Vehicle Inner Chassis)

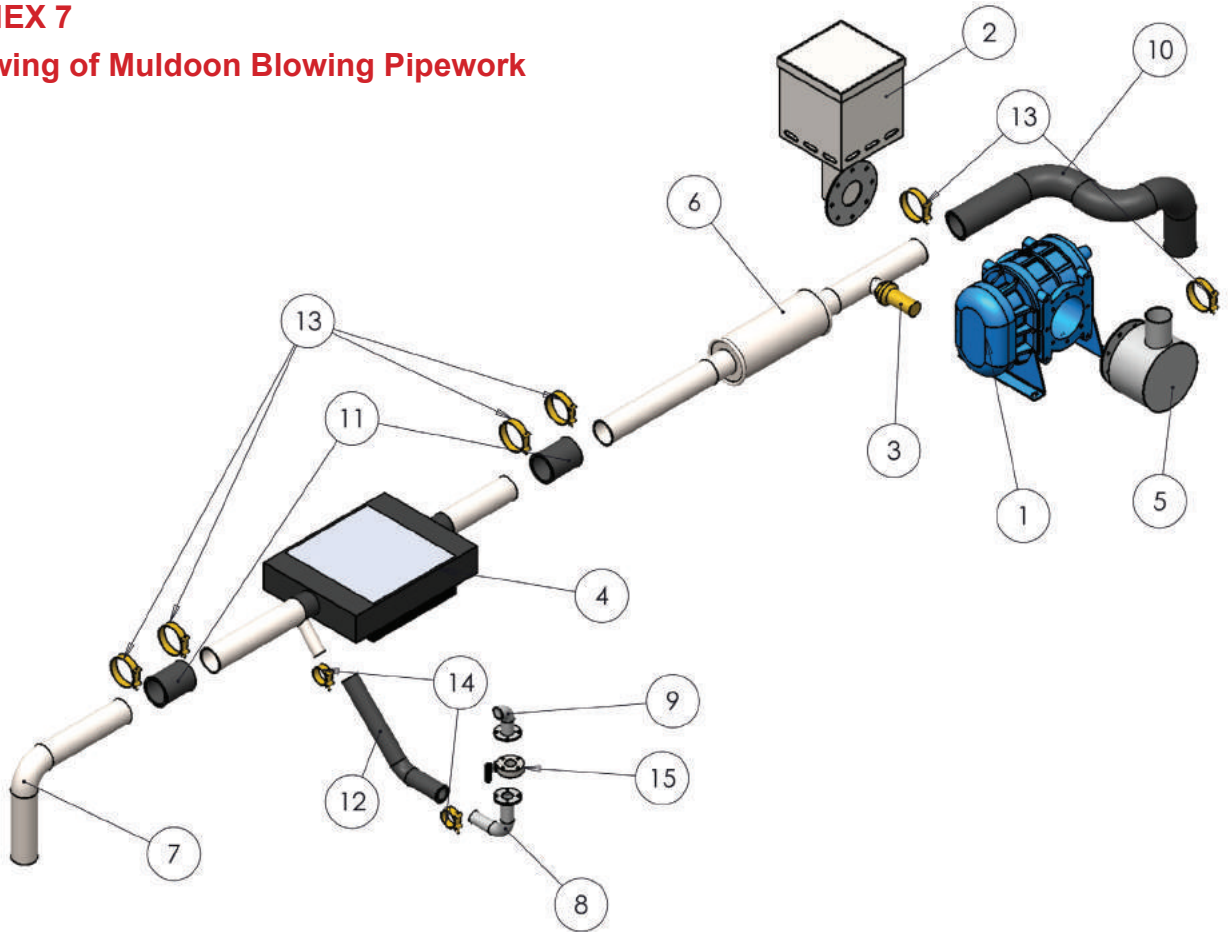
Fig 22 - Blower Intake Filter
(Located Centre of Vehicle Chassis)

ANNEX 6 - Drawing of MULDOON Pneumatic Discharge Equipment AUGER/ ROTARY SEAL ETC



ANNEX 7

Drawing of Muldoon Blowing Pipework



ANNEX 7
Drawing of Muldoon Blowing Pipework

PARTS LIST

	PART NAME	PART NUMBER	QUANTITY
1.	Blower	Holmes-68-RBVMO	1
2.	Intake Silencer	GM-BL-BX-INTAKE	1
3.	Blow Off Valve	MULDOON-A50	1
4.	Electric Air Cooler	GM-TA-E-AC	1
5.	Blower Silencer	GM-BL-BX-64-STD	1
6.	Silencer	GM-BL-BX-64-STD	1
7.	90 deg Stainless Bend	GM-SS-BMD-1001	1
8.	Gate Valve Bend	GM-GV-90-1	1
9.	Gate Valve Bend	GM-GV-90-2	1
10.	Blow Hose	HOSE-AB-P-M	1
11.	Joining Rubber	HOSE-102-FLEX	2
12.	Vent Hose	HOSE-JT-52	1
13.	Mikalor Clamp	HOSE-MC-113-121	6
14.	Mikalor Clamp	HOSE-MC-68-73	2
15.	Gate Valve	MA-VALVE-30-028	1

ANNEX 8

Edbro

OPERATOR'S MANUAL

NEW C SERIES HOISTS

Edbro

SETTING THE INDUSTRY STANDARD

CONTENTS

CORRECT USE

This hoist is designed to be assembled into a tipping vehicle for the movement of bulk commodities. This manual is intended as a general guide for safe tipping but more specific safety guidance should be supplied by the bodybuilder depending on the nature of the equipment.

The bodybuilder can also advise on maximum load capacity of the equipment, bearing in mind the hoist capability and road traffic regulations.

IDENTIFICATION

The hoist is identified by a serial number plate on the inlet feed port (see opposite).

The serial number and model code should be quoted in all correspondence.

The date of manufacture is quoted as a week number/ year.

Serial numbers for Edbro PTO and pumps are stamped on the casing or on a separate plate.

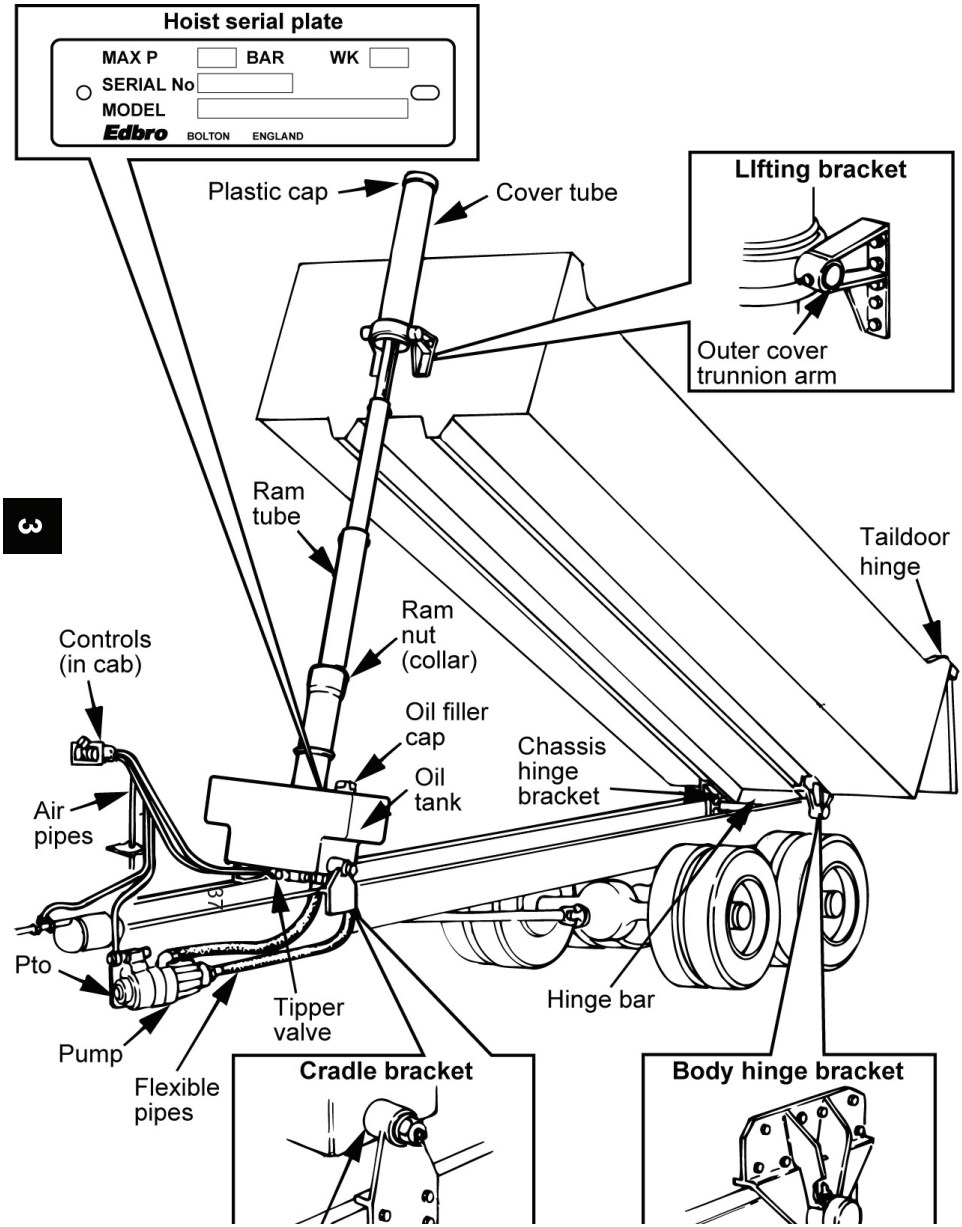
FAMILIARISATION

Before using the equipment, familiarise yourself with the key features opposite. The position of the hydraulic parts may vary depending on specification.

Before putting into service, confirm that the equipment is in good working order.

Check:

- hoses and fittings for abrasion and leaks
- check security of hoist and hinge mountings
- check oil level
- check, where applicable, that quickly detachable couplings are tight
- check PTO warning light is working.


Hoist serial plate
MAX P
BAR
WK
SERIAL No
MODEL
Edbro
BOLTON
ENGLAND
Plastic cap
Cover tube
LIfting bracket
Outer cover trunnion arm
Ram tube
Taildoor hinge
Ram nut (collar)
Controls (in cab)
Oil filler cap
Oil tank
Chassis hinge bracket
Air pipes
Pto
Tipper valve
Pump
Flexible pipes
Hinge bar
Cradle bracket
Body hinge bracket

SAFETY

Tipping is always hazardous and sometimes dangerous.

Vehicles can be overturned by sticking loads, poor ground conditions, high cross winds or bad practices such as tipping on a side slope.

So:

- do not tip until you have read and understood this manual
- remember the hoist (tipping gear) is designed to lift; it is not a stabiliser
- if the vehicle overturns, any damage to the hoist is the RESULT and not the CAUSE of the turnover
- avoid accidents by following the safety code on pages 6 and 7
- it is the responsibility of the operator to ensure that drivers are suitably trained in the use of this equipment

OPERATING PRESSURE

Normally this hoist must only be operated at a maximum rated pressure shown on the identification plate. Normally this is 175 bar, but it may lower if there is a technical limitation applied.

Alternatively it may be possible to use the cylinder at a higher pressure if this is specifically agreed with the bodybuilder. In such cases, the bodybuilder will be responsible for displaying the maximum pressure.

The hoist works best if the vehicle is fitted with matching Edbro hydraulics (PTO, pump, valves, oil tank, pipes and controls).

If thes vehicle has Edbro hydraulics, NEVER TRY TO ALTERTHE PRESSURE SETTING OF THE RELIEF (OVERLOAD VALVE). The valve is preset at the factory.

If the tractor has non Edbro hydraulics make sure they include a pressure relief (overload) valve which is:

- capable of accepting the maximum flow from the pump
- set correctly for this application

This is very important. The lack of a correct pressure relief (overload) valve can be VERY DANGEROUS.

SAFETY CODE

ALWAYS

- keep the tyres at the correct pressure
- spread the load evenly in the body
- for articulated units, make sure the trailer is coupled and in line with the motive unit.
- make sure the danger area is clear of people and obstructions (refer to SAFETY CODE)
- during tipping, stay in the cab at the controls, if danger signs develop (for example, if the body starts to lean to one side or the load sticks) immediately lower the body
- preventing the discharging load from piling up and fouling on the taildoor by driving forward VERY SLOWLY BY NO MORE THAN A METRE AT A TIME
- just before loading, move the control lever to lower to ensure that no oil is trapped in the cylinder and the full load rests on the chassis.

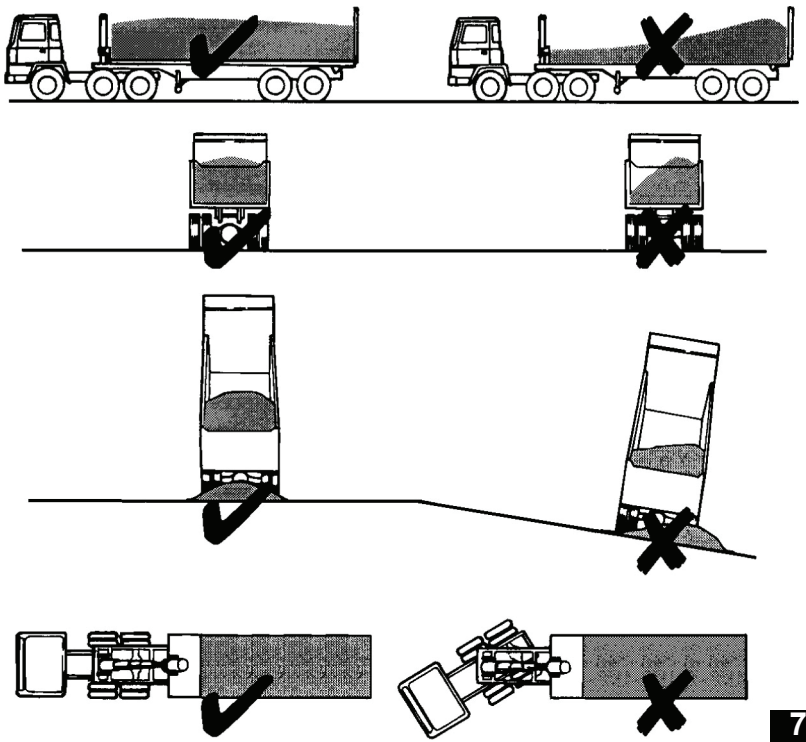
EXTRA CAUTION

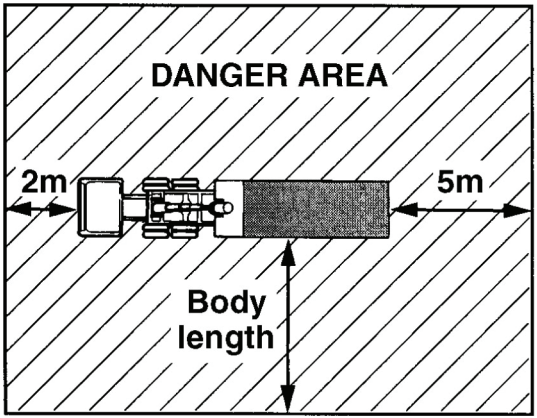
Be particularly careful in frosty weather. Frost can cause wet loads to stick and discharge unevenly.

NEVER

- overload
- alter the pressure setting of the relief (overload) valve
- put the tipper lever in “tip” unless you are actually tipping
- tip an uncoupled trailer
- tip in high winds
- tip on a side slope
- tip with the body within 5 metres of overhead power lines
- shake the load free
- drive off with the body up or the PTO engaged. This could damage the equipment.
- leave the body up overnight
- leave the tractor with the ignition key in
- go under a raised LOADED body
- go under a raised EMPTY body (unless it is propped)
- uncouple the trailer unless the body is down and the PTO is “out”
- steam clean the exposed cylinder tubes, this will cause corrosion
- climb on the equipment by any means other than that provided by the bodybuilder

SAFETY CODE





Always ensure that no person, animal or other equipment is within this area when tipping

7

CONTROLS

Your Edbro hoist works best if the vehicle is fitted with matching Edbro hydraulics (PTO, pump, valves, oil tank, pipes and controls).

The PTO and tipper controls are combined in one unit and work off the vehicles air system (Fig A)

The PTO control switch is fitted with a PTO engaged warning light.

The tipper control is a lever with four safety features:

- a spring loaded device stops it from being accidentally moved into “raise” or “lower
- a spring return to “hold” from ‘raise’ position, known as a deadman’s handle function, ensures the driver keeps his hand on the tipper control ***all the time*** the body is being raised
- when the lever is moved from ‘hold’ towards ‘lower’, the PTO is *automatically disengaged; this internal mechanical feature prevents PTO, pump or gearbox damage if you forget to disengage the PTO before driving off
- controlled lowering (feathering) regulates speed or descent for loaded or part loaded bodies.

This type of control is recommended for conformity with European standards. Other controls are available but, if used, the bodybuilder will need to ensure that all Essential Safety Requirements are covered by other means. For example, separate controls are available (fig b).

*Alternative combined controls ***without*** automatic PTO disengagement feature (for spreading or discharge applications) are available.

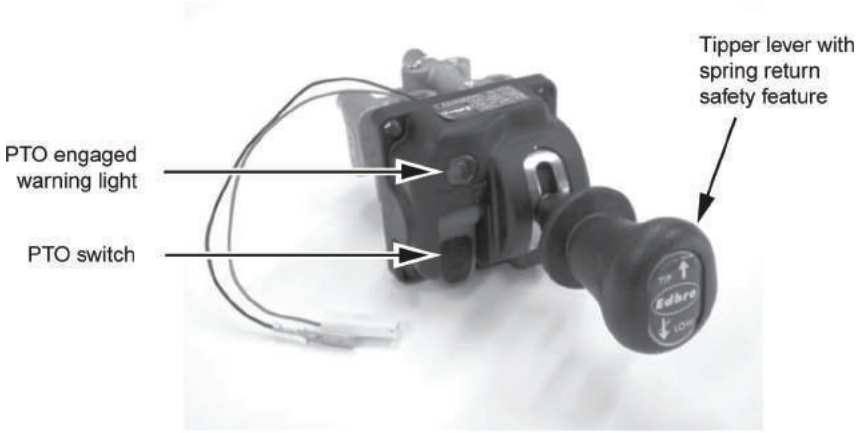


Fig. a. **Combined PTO & tipper air controls**

Fig. b. **Separate tipper air control**

HOW TO LIFT THE BODY

Make sure the handbrake is on, the gear lever is in neutral, the tipper lever is in ‘hold’ and the PTO switch is ‘out’

Then:

- if fitted, lower the rear stabiliser legs
- unlock the taildoor or grain hatch (taking care to stand clear)
- return to the cab, start the engine and make sure the air pressure is at the level recommended by the manufacturer
- remain in the cab until the tipping operation is complete
- depress the clutch* and wait 4 seconds (8 seconds for a gearbox with a rear mounted PTO)
- press the safety latch and switch the PTO ‘in’ (the warning light will come on)
- release the clutch
- make sure no-one is within the danger area (see page 7)
- move the tipper lever to ‘raise’ and hold in position. Releasing pressure on the lever will stop the body lifting.
- raise the body SMOOTHLY by varying the engine revs but never exceed 1500RPM
- prevent the discharging load from piling up and fouling the taildoor by driving forward VERY SLOWLY BY NO MORE THAN A METRE AT A TIME
- when the body gets to the tipping angle you want, release the tipper lever to ‘hold’
- if you need to spread the load, release the handbrake and drive forward VERY SLOWLY

* If you have an automatic gearbox, the PTO operation will be different.
Refer to the PTO installer for specific instructions.

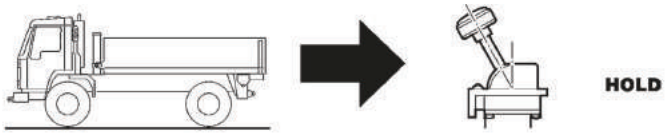
HOW TO LOWER THE BODY

Make sure that no-one is in the danger area (See Page 7), then:

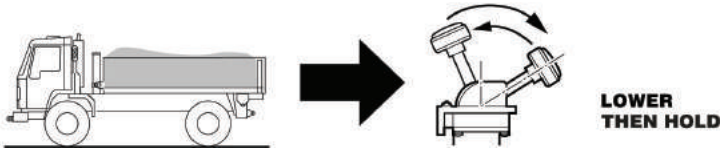
- SLOWLY move the tipper lever out of 'hold' towards 'lower'; this will automatically disengage the PTO and the warning light will go out. If automatic PTO disengagement isn't fitted, switch the PTO to 'out' before driving off.
- regulate the speed the body comes down by moving the lever towards 'hold' to slow it down or towards 'lower' to speed its descent
- when the body is down, move the lever back to 'hold'
- lock the taildoor
- if fitted, raise the stabiliser legs

⚠ DO NOT DRIVE OFF UNTIL THE BODY IS FULLY DOWN. MAKE SURE THAT THE PTO IS DISENGAGED BEFORE DRIVING OFF.

WHEN DRIVING



When UNLADEN leave the cab control in HOLD to minimise body bounce.



When LOADING, put the cab in LOWER to ensure that no oil is trapped in the cylinder and the entire load rests on the chassis. Then, return the control to HOLD when travelling.

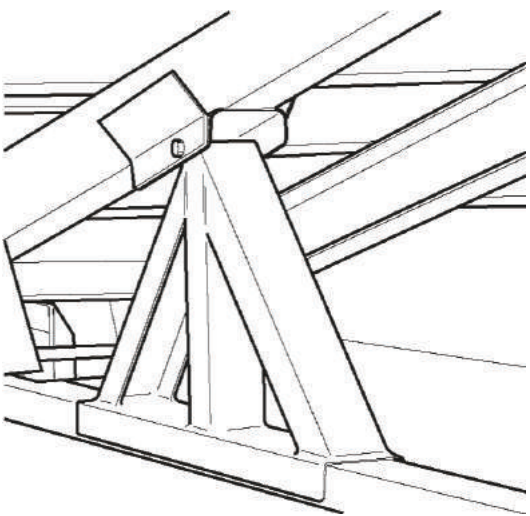
11

SAFETY DURING MAINTENANCE

A body prop is considered by Edbro to be an Essential Safety Requirement. A prop must always be used if maintenance needs to be undertaken with the body raised.

- never attempt to prop a loaded body
- use a prop designed to locate securely between the body underframe and chassis
- the prop must be between body and chassis, not between the body and the ground
- lower the body gently onto the prop to minimise damage
- confirm that the prop is sufficiently strong to carry the bodyweight

⚠ IT IS THE OPERATORS RESPONSIBILITY TO ENSURE THAT ONLY FULLY TRAINED PERSONNEL REPAIR OR SERVICE THIS EQUIPMENT. IF NECESSARY, CONTACT YOUR LOCAL SERVICE AGENT FOR ASSISTANCE.



MAINTENANCE

WEEKLY
Make sure the body is down, the handbrake is on and the engine is switched off. Then top up the oil in hte tank to dipstick level with clean hydraulic oil (refer page 16).
Use a grease gun to lubricate the points shown in the inset diagrams on pages 14 or 15 with a good quality, multipurpose grease.

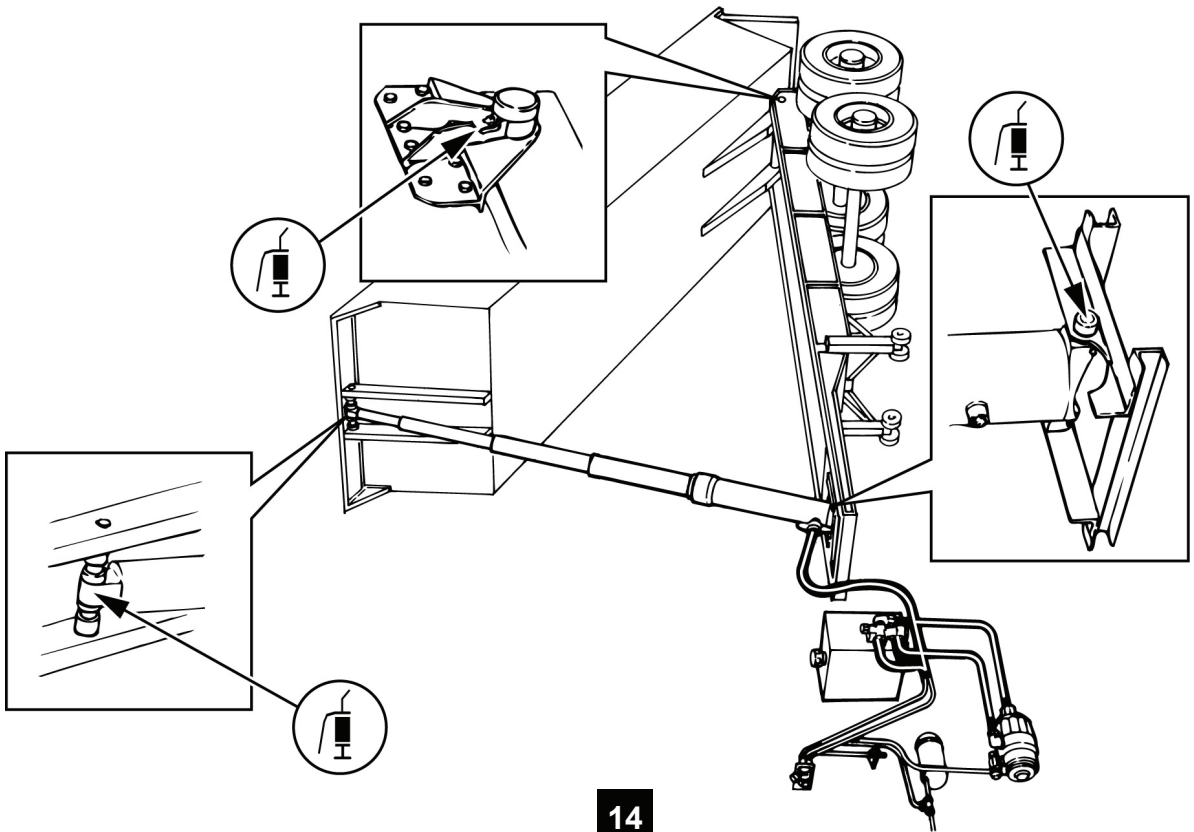
MONTHLY
Grease the taildoor hinge and locking mechanism.
Where appropriate, check that the quickly detachable couplings seal when uncoupled.
Replace any worn or damaged flexible pipes.
Make sure all flexible pipes are secured to the chassis and are not hanging loose.
Check the outer cover fixing studs are tight.
Tighten any loose pipe connections.
Check and tell your Edbro service dealer if:

- the outer cover (where applicable) is loose (side to side or rotating)
- any ram tube is damaged
- the ram trunnion arms, the outer cover trunnion arms, or the rear hinge brackets are worn
- oil is leaking from the ram tubes, tipper valve, PTO, pump or flexible pipes
- air is leaking from the ram tubes, tipper valve, PTO, pump or flexible pipes
- air is leaking from the air pipes
- air is leaking continuously from the controls

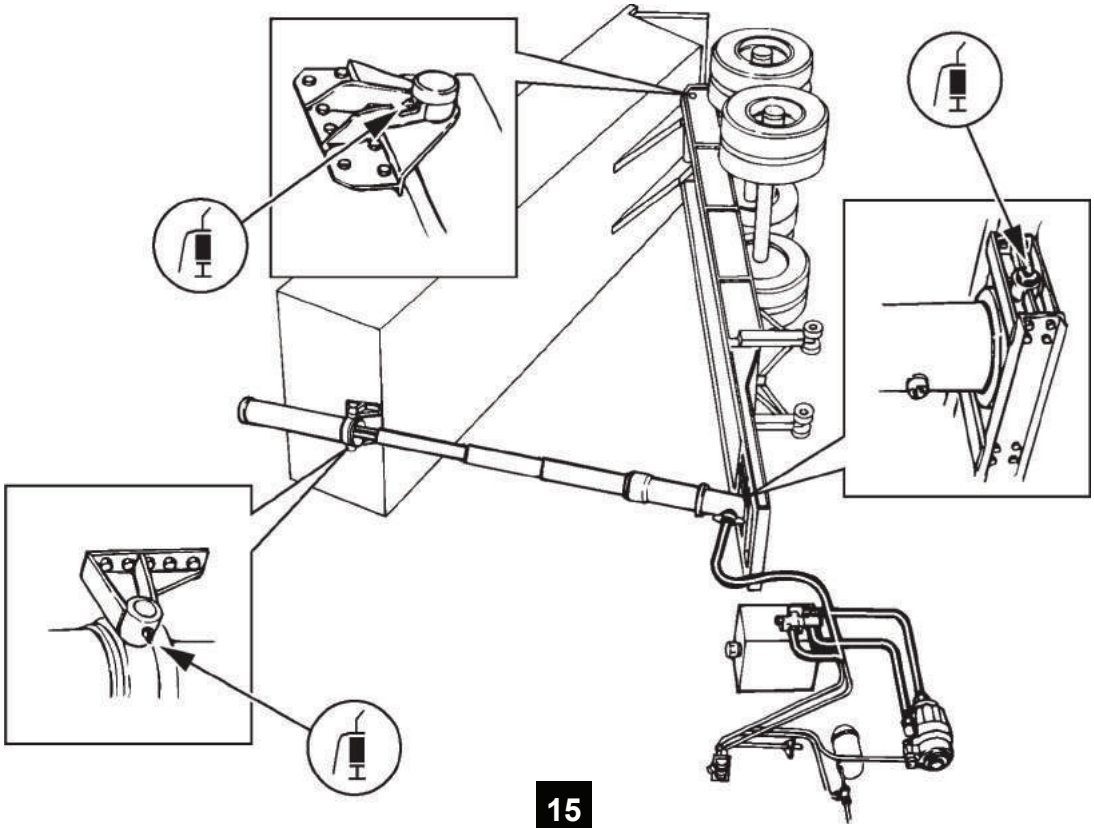
THREE MONTHLY
Use spanners to check the tightness of the fixing bolts on the tipper valve, PTO and brackets.

YEARLY (more often in dusty or dirty conditions)
Drain and refill the tank with clean hydraulic oil (refer page 16). In order to protect the environment, ensure that no oil is spilled when draining, and old oil is disposed of correctly.

Depending on the specification of your equipment, other maintenance checks may be required. These should be advised by the bodybuilder/ installer.



14



15

OIL

Dirty oil is the enemy of a hydraulic system. The cleaner the oil, the more efficient the hoist's operation and the longer it's life. So always use clean hydraulic oil for topping up or changing the oil in the tank.

Use oil to specification ISO6734/4HM32 for temperatures between -20°C to +30°C. Typical suitable trade names are:

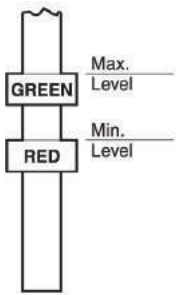
CASTROL	AWS32
ESSO	VG32
GULF	HYDRASIL 32
MOBIL	DTE24
SHELL	TELLUS32

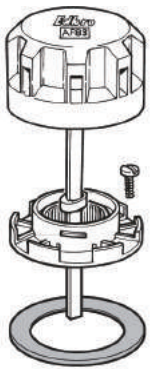
For other climates seek advice from your local distributor or direct from Edbro.

Never put used oil in the tank.

To determine the oil level, remove the filler cap and check that the level is within the max./min. marks as shown:

Correct oil level:
- not above green mark on dipstick
- not below red mark on dipstick





Edbro combined filler/breather assembly

BLEEDING THE SYSTEM

If the hoist judders in 'LOWER', or tubes operate out of sequence when lowering, there may be air in the system. For early cylinders without a bleed screw (approximately, serial numbers between LG017000/ LH002100) bleed the system as follows:

- loosen the pressure outlet hose from the pump a little

BLEEDING THE SYSTEM

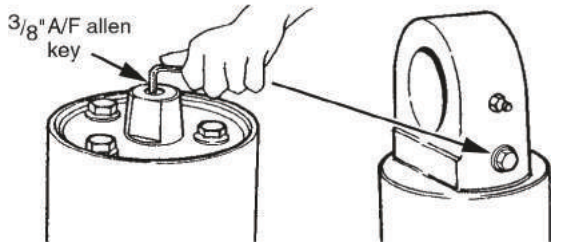
- loosen the hose connection at the cylinder
- then with the pump running at low speed, put the control valve into 'TIP'. After a few seconds any air will have escaped and the connections can be tightened.

⚠ ***Warning: Take care to guard against the escape of high pressure oil***

- tip the hoist to full stroke and leave the pump running on engine tick-over with the control in 'TIP' for approx. 5 minutes. This will purge the cylinder of air through the oil into the tank and filler/ breather
- if the hoist still shows signs of trapped air, tip the body to full stroke a further 10 times, and at the end of each stroke leave the cab control in 'TIP' for about 30 seconds before lowering
- finally, re-check the oil level

For later cylinders with a bleed screw (approximately, serial numbers after LG017000 | LH002100).

- lift the body to about 300mm (12") above the chassis frame
- put the tipper lever in 'HOLD'
- locate the bleed screw and slacken about one turn
- the body will come down slowly and force the air out of the system
- when oil flows freely, tighten the bleed screw
- if the hoist is still jerky, or sluggish, repeat the whole procedure
- lower the body, and top up the tank with clean oil
- replace the plastic cap on the top of the outer cover



Bleeding an outer cover hoist **Bleeding an eye-ended hoist**

17

PROBLEM SOLVING

The following action can be taken without special tools. If unsuccessful, call the nearest Edbro service dealer (refer to www.edbro.com).

THE HOIST IS JERKY OR SLUGGISH

Air may be trapped in the system. Check oil level and then operate the hoist to full stroke several times; any air will be dissipated back to the tank. (see page 17)

THE BODY WILL NOT TIP

Make sure:

- the vehicle air pressure has had enough time to build up (see vehicle operator's manual)
- the oil in the tank is up to dipstick level (refer page 16)
- the PTO switch is 'in' and PTO is engaged (oil is circulating)
- the tipper lever is in 'raise'
- there are no kinks in the oil pipes
- the quickly detachable couplings of the tractor and trailer, where applicable, are clean and screwed together tightly
- no air is leaking from the air pipes.

THE BODY WILL NOT LOWER

Check PTO has disengaged and warning light is out.

Put the tipper lever back in 'raise'. Then:

- rev the engine until the relief (overload) valve blows, i.e. until you hear a high pitched noise coming from the tipper valve (page 3)
- keep the engine revs going for five seconds
- lower the body (page 11).

If the body still will not come down, put the tipper lever in 'hold', PROP THE BODY, switch the PTO to 'out' and turn off the engine.

PROBLEM SOLVING

THE BODY STOPS ON THE WAY UP

Lower the body as slowly as possible. Then make sure:

- the body is not overloaded or badly distributed
- the oil in the tank is up to dipstick level (refer page 16)

THE BODY WILL NOT STAY UP WITH THE TIPPER LEVER IN 'HOLD'

Put the tipper lever back in 'raise and lift the body. Then:

- rev the engine until the relief (overload) valve blows, i.e. until you hear a high pitched noise coming from the tipper valve (page 3)
- keep the engine revs going for five seconds
- put the tipper lever in 'hold'

If the body still will not stay up, lower the body.

EXCESSIVE NOISE

- check the oil level
- check pipes for kinks and leaks

SPARE PARTS & SERIVCE

Use only genuine Edbro parts from Edbro service dealers. Refer to the online Dealer Locator at www.edbro.com for a full list of service dealers and distributors.

Always quote the component part number and serial number when ordering parts or seeking advice.

ANNEX 9

Edbro

OPERATOR'S MANUAL

CX & CS 11,13, & 15 HOISTS

Edbro
SETTING THE INDUSTRY STANDARD

CONTENTS

CORRECT USE

This hoist is designed to be assembled into a tipping vehicle for the movement of bulk commodities. This manual is intended as a general guide for safe tipping but more specific safety guidance should be supplied by the bodybuilder depending on the nature of the equipment.

The bodybuilder can also advise on maximum load capacity of the equipment, bearing in mind the hoist capability and road traffic regulations.

IDENTIFICATION

The hoist is identified by a serial number plate on the inlet feed port of a CS separate ram/ tank hoist or on the side of the oil tank on a CX combined ram/ tank. (see opposite)

The serial number and model code should be quoted in all correspondence.

The date of manufacture is quoted as a week number/ year.

Serial numbers for Edbro PTO and pumps are stamped on the casing or on a separate plate.

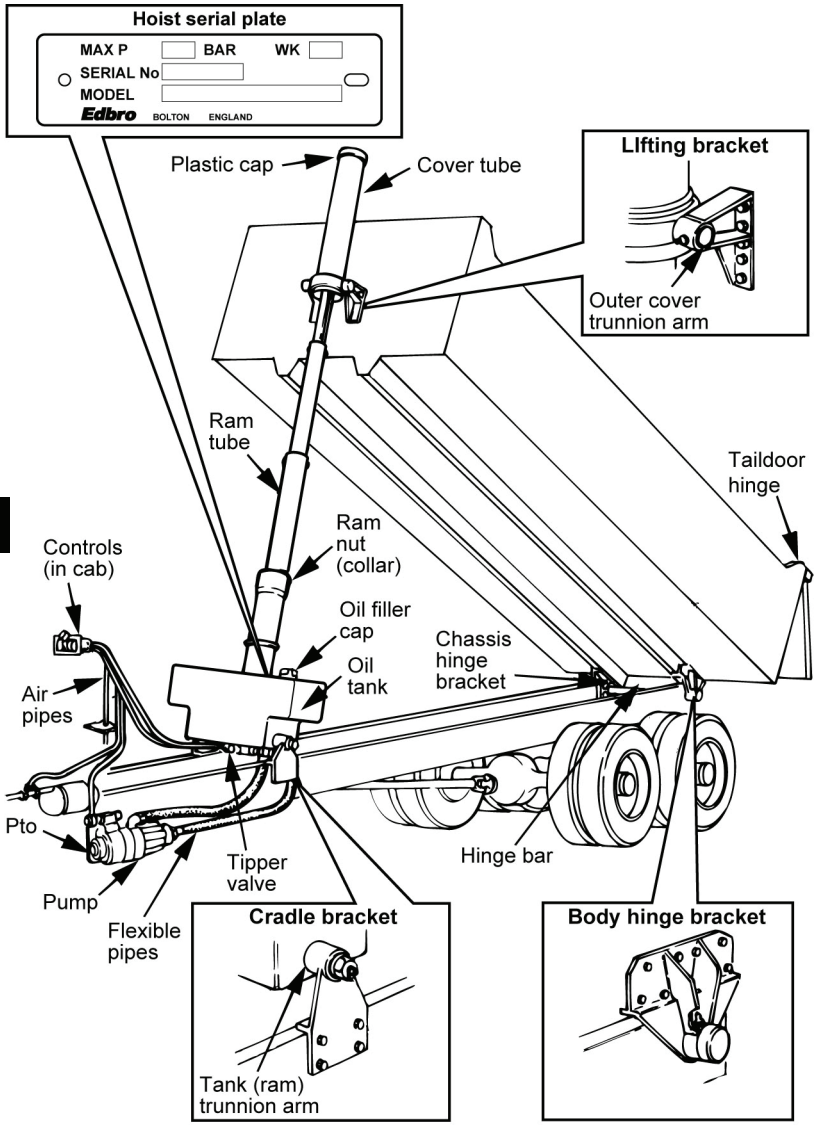
FAMILIARISATION

Before using the equipment, familiarise yourself with the key features opposite. The position of the hydraulic parts may vary depending on specification.

Before putting into service, confirm that the equipment is in good working order.

Check:

- hoses and fittings for abrasion and leaks
- check security of hoist and hinge mountings
- check oil level
- check PTO warning light is working.



CX Combined ram and tank hoist

SAFETY

Tipping is always hazardous and sometimes dangerous.

Vehicles can be overturned by sticking loads, poor ground conditions, high cross winds or bad practices such as tipping on a side slope.

So:

- do not tip until you have read and understood this manual
- remember the hoist (tipping gear) is designed to lift; it is not a stabiliser
- if the vehicle overturns, any damage to the hoist is the RESULT and not the CAUSE of the turnover
- avoid accidents by following the safety code on pages 6 and 7
- it is the responsibility of the operator to ensure that drivers are suitably trained in the use of this equipment

OPERATING PRESSURE

The hoist must only be operated up to a maximum pressure shown on the identification plate. Normally this is 150 bar (2,200psi) but it may lower if there is a risk of buckling failure on long stroke hoists.

The hoist works best if the vehicle is fitted with matching Edbro hydraulics (PTO, pump, valves, oil tank, pipes and controls).

If thes vehicle has Edbro hydraulics, NEVER TRY TO ALTERTHE PRESSURE SETTING OF THE RELIEF (OVERLOAD VALVE). The valve is preset at the factory.

SAFETY CODE

ALWAYS

- keep the tyres at the correct pressure
- spread the load evenly in the body
- before tipping make sure your truck is on firm, level ground
- make sure the danger area is clear of people and obstructions (refer to SAFETY CODE)
- during tipping, stay in the cab at the controls, if danger signs develop (for example, if the body starts to lean to one side or the load sticks) immediately lower the body
- preventing the discharging load from piling up and fouling on the taildoor by driving forward VERY SLOWLY BY NO MORE THAN A METRE AT A TIME
- just before loading, move the control lever to lower to ensure that no oil is trapped in the cylinder and the full load rests on the chassis.

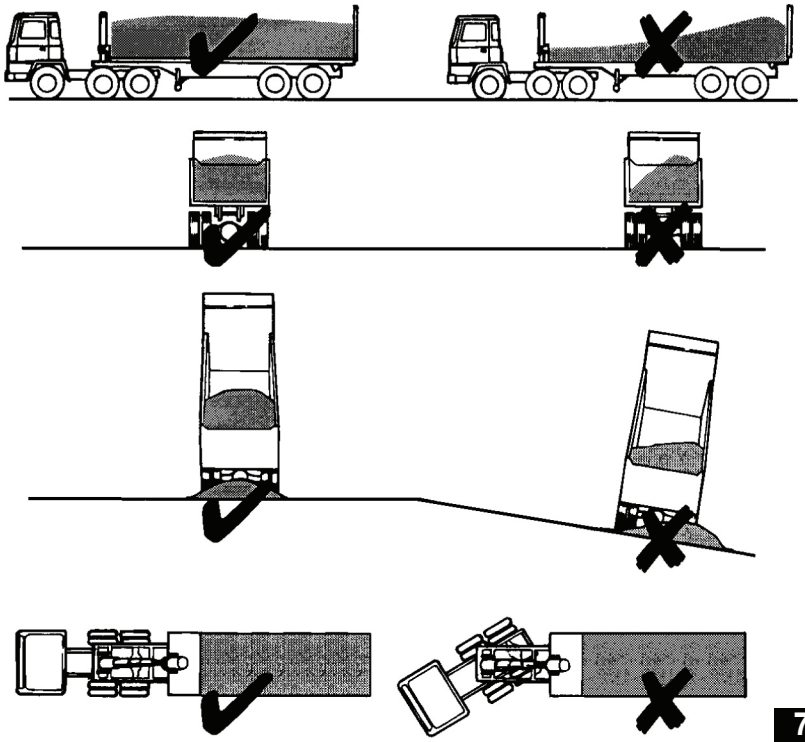
EXTRA CAUTION

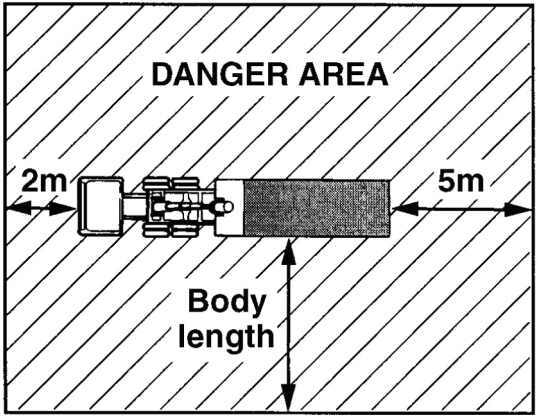
Be particularly careful in frosty weather. Frost can cause wet loads to stick and discharge unevenly.

NEVER

- overload
- alter the pressure setting of the relief (overload) valve
- put the tipper lever in “tip” unless you are actually tipping
- tip in high winds
- tip on a side slope
- tip with the body within 5 metres of overhead power lines
- shake the load free
- drive off with the body up or the PTO engaged. This could damage the equipment.
- leave the body up overnight
- leave the tractor with the ignition key in
- go under a raised LOADED body
- go under a raised EMPTY body (unless it is propped)
- uncouple the trailer unless the body is down and the PTO is “out”
- steam clean the exposed cylinder tubes, this will cause corrosion
- climb on the equipment by any means other than that provided by the bodybuilder

SAFETY CODE





Always ensure that no person, animal or other equipment is within this area when tipping

7

CONTROLS

Your Edbro hoist works best if the vehicle is fitted with matching Edbro hydraulics (PTO, pump, valves, oil tank, pipes and controls).

The PTO and tipper controls are combined in one unit and work off the vehicles air system (Fig A)

The PTO control switch is fitted with a PTO engaged warning light.

The tipper control is a lever with four safety features:

- a spring loaded device stops it from being accidentally moved into “raise” or “lower
- a spring return to “hold” from ‘raise’ position, known as a deadman’s handle function, ensures the driver keeps his hand on the tipper control ***all the time*** the body is being raised
- when the lever is moved from ‘hold’ towards ‘lower’, the PTO is *automatically disengaged; this internal mechanical feature prevents PTO, pump or gearbox damage if you forget to disengage the PTO before driving off
- controlled lowering (feathering) regulates speed or descent for loaded or part loaded bodies.

This type of control is recommended for conformity with European standards. Other controls are available but, if used, the bodybuilder will need to ensure that all Essential Safety Requirements are covered by other means. For example, separate controls are available (fig b).

*Alternative combined controls ***without*** automatic PTO disengagement feature (for spreading or discharge applications) are available.

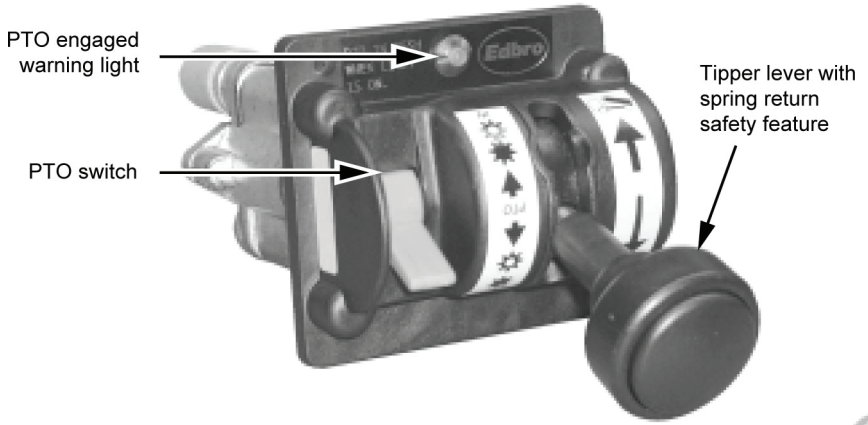


Fig. a. **Combined PTO & tipper air controls**

Fig. b. **Separate tipper air control**

HOW TO LIFT THE BODY

Make sure the handbrake is on, the gear lever is in neutral, the tipper lever is in ‘hold’ and the PTO switch is ‘out’

Then:

- unlock the taildoor or grain hatch (taking care to stand clear)
- return to the cab, start the engine and make sure the air pressure is at the level recommended by the manufacturer
- remain in the cab until the tipping operation is complete
- depress the clutch* and wait 4 seconds (8 seconds for a gearbox with a rear mounted PTO)
- press the safety latch and switch the PTO ‘in’ (the warning light will come on)
- release the clutch
- make sure no-one is within the danger area (see page 7)
- move the tipper lever to ‘raise’ and hold in position. Releasing pressure on the lever will stop the body lifting.
- raise the body SMOOTHLY by varying the engine revs but never exceed 1500RPM
- prevent the discharging load from piling up and fouling the taildoor by driving forward VERY SLOWLY BY NO MORE THAN A METRE AT A TIME
- when the body gets to the tipping angle you want, release the tipper lever to ‘hold’
- if you need to spread the load, release the handbrake and drive forward VERY SLOWLY

* If you have an automatic gearbox, the PTO operation will be different.
Refer to the PTO installer for specific instructions.

HOW TO LOWER THE BODY

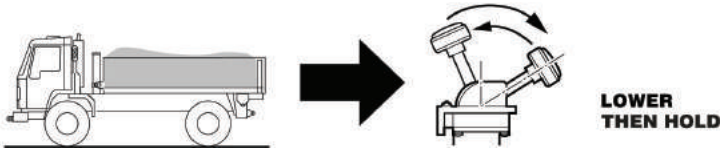
Make sure that no-one is in the danger area (See Page 7), then:

- SLOWLY move the tipper lever out of 'hold' towards 'lower'; this will automatically disengage the PTO and the warning light will go out. If automatic PTO disengagement isn't fitted, switch the PTO to 'out' before driving off.
- regulate the speed the body comes down by moving the lever towards 'hold' to slow it down or towards 'lower' to speed its descent
- when the body is down, move the lever back to 'hold'
- lock the taildoor

⚠ DO NOT DRIVE OFF UNTIL THE BODY IS FULLY DOWN. MAKE SURE THAT THE PTO IS DISENGAGED BEFORE DRIVING OFF.

WHEN DRIVING

When UNLADEN leave the cab control in HOLD to minimise body bounce.



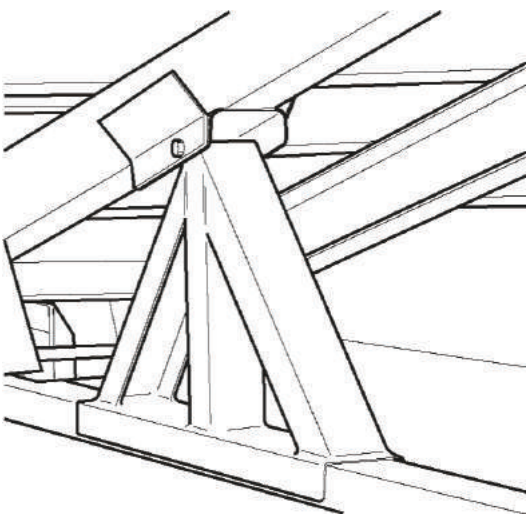
When LOADING, put the cab in LOWER to ensure that no oil is trapped in the cylinder and the entire load rests on the chassis. Then, return the control to HOLD when travelling.

SAFETY DURING MAINTENANCE

A body prop is considered by Edbro to be an Essential Safety Requirement. A prop must always be used if maintenance needs to be undertaken with the body raised.

- never attempt to prop a loaded body
- use a prop designed to locate securely between the body underframe and chassis
- the prop must be between body and chassis, not between the body and the ground
- lower the body gently onto the prop to minimise damage
- confirm that the prop is sufficiently strong to carry the bodyweight

⚠ IT IS THE OPERATORS RESPONSIBILITY TO ENSURE THAT ONLY FULLY TRAINED PERSONNEL REPAIR OR SERVICE THIS EQUIPMENT. IF NECESSARY, CONTACT YOUR LOCAL SERVICE AGENT FOR ASSISTANCE.



MAINTENANCE

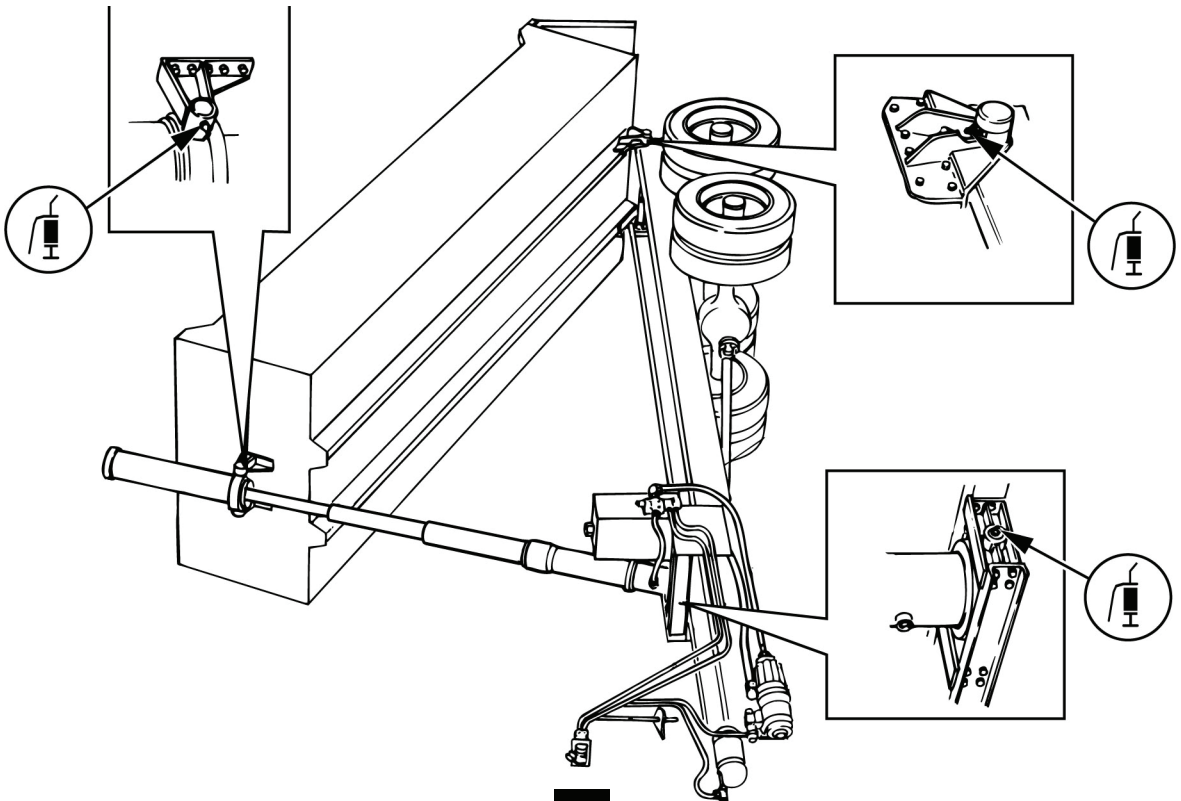
MONTHLY
Make sure the body is down, the handbrake is on and the engine is switched off. Then top up the oil in hte tank to dipstick level with clean hydraulic oil (refer page 16).
Use a grease gun to lubricate the points shown in the inset diagrams on pages 14 or 15 with a good quality, multipurpose grease.
Grease the taildoor hinge and locking mechanism.
Where appropriate, check that the quickly detachable couplings seal when uncoupled.
Replace any worn or damaged flexible pipes.
Make sure all flexible pipes are secured to the chassis and are not hanging loose.
Check the outer cover fixing studs are tight.
Tighten any loose pipe connections.
Check and tell your Edbro service dealer if:

- the outer cover (where applicable) is loose (side to side or rotating)
- any ram tube is damaged
- the base nut is loose
- the ram trunnion arms, the outer cover trunnion arms, or the rear hinge brackets are worn
- oil is leaking from the ram tubes, tipper valve, PTO, pump or flexible pipes
- air is leaking from the air pipes
- air is leaking continuously from the controls

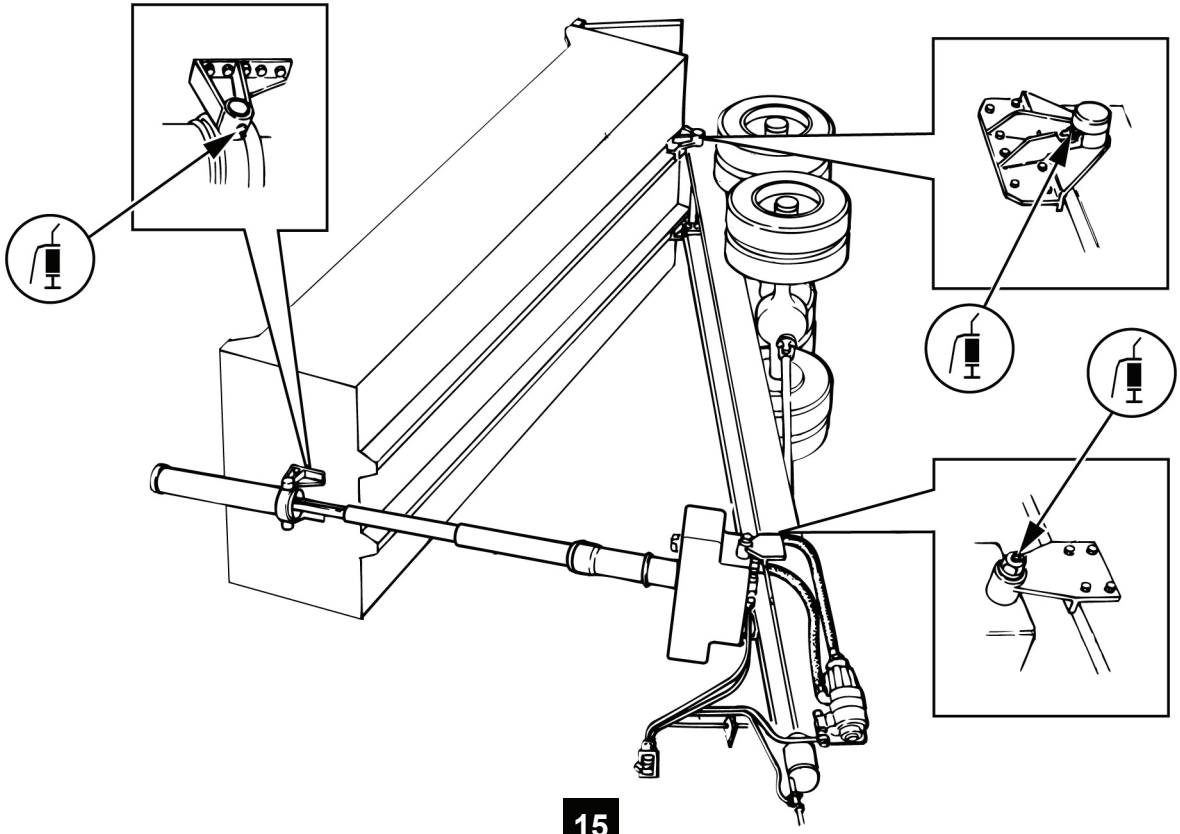
THREE MONTHLY
Use spanners to check the tightness of the fixing bolts on the tipper valve, PTO and brackets.

YEARLY (more often in dusty or dirty conditions)
Drain and refill the tank with clean hydraulic oil (refer page 16). In order to protect the environment, ensure that no oil is spilled when draining, and old oil is disposed of correctly.

Depending on the specification of your equipment, other maintenance checks may be required. These should be advised by the bodybuilder/ installer.



14



15

OIL

Dirty oil is the enemy of a hydraulic system. The cleaner the oil, the more efficient the hoist's operation and the longer it's life. So always use clean hydraulic oil for topping up or changing the oil in the tank.

Use oil to specification ISO6734/4HM32 for temperatures between -20°C to +30°C. Typical suitable trade names are:

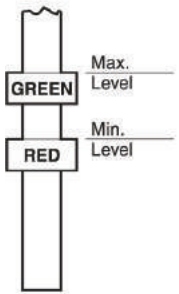
CASTROL	AWS32
ESSO	VG32
GULF	HYDRASIL 32
MOBIL	DTE24
SHELL	TELLUS32

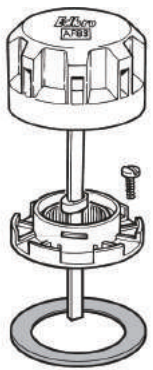
For other climates seek advice from your local distributor or direct from Edbro.

Never put used oil in the tank.

To determine the oil level, remove the filler cap and check that the level is within the max./min. marks as shown:

Correct oil level:
- not above green mark on dipstick
- not below red mark on dipstick





Edbro combined filler/breather assembly

BLEEDING THE SYSTEM

If the hoist judders in 'LOWER', or tubes operate out of sequence when lowering, there may be air in the system. For early cylinders without a bleed screw (approximately, serial numbers between LG017000/ LH002100) bleed the system as follows:

- loosen the pressure outlet hose from the pump a little

BLEEDING THE SYSTEM

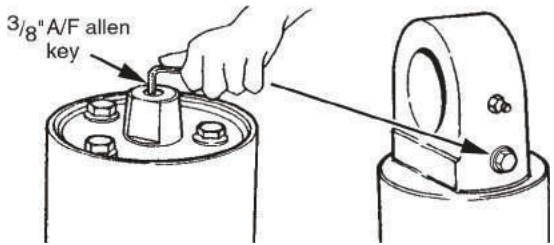
- loosen the hose connection at the cylinder
- then with the pump running at low speed, put the control valve into ‘TIP’. After a few seconds any air will have escaped and the connections can be tightened.

⚠ ***Warning: Take care to guard against the escape of high pressure oil***

- tip the hoist to full stroke and leave the pump running on engine tick-over with the control in ‘TIP’ for approx. 5 minutes. This will purge the cylinder of air through the oil into the tank and filler/ breather
- if the hoist still shows signs of trapped air, tip the body to full stroke a further 10 times, and at the end of each stroke leave the cab control in ‘TIP’ for about 30 seconds before lowering
- finally, re-check the oil level

For later cylinders with a bleed screw (approximately, serial numbers after LG017000 | LH002100).

- lift the body to about 300mm (12”) above the chassis frame
- put the tipper lever in ‘HOLD’
- locate the bleed screw and slacken about one turn
- the body will come down slowly and force the air out of the system
- when oil flows freely, tighten the bleed screw
- if the hoist is still jerky, or sluggish, repeat the whole procedure
- lower the body, and top up the tank with clean oil
- replace the plastic cap on the top of the outer cover



Bleeding an outer cover hoist **Bleeding an eye-ended hoist**

PROBLEM SOLVING

The following action can be taken without special tools. If unsuccessful, call the nearest Edbro service dealer (refer to www.edbro.com).

THE HOIST IS JERKY OR SLUGGISH

Air may be trapped in the system. Check oil level and then operate the hoist to full stroke several times; any air will be dissipated back to the tank. (see page 17)

THE BODY WILL NOT TIP

Make sure:

- the vehicle air pressure has had enough time to build up (see vehicle operator's manual)
- the oil in the tank is up to dipstick level (refer page 16)
- the PTO switch is 'in' and PTO is engaged (oil is circulating)
- the tipper lever is in 'raise'
- there are no kinks in the oil pipes
- the quickly detachable couplings of the tractor and trailer, where applicable, are clean and screwed together tightly
- no air is leaking from the air pipes.

THE BODY WILL NOT LOWER

Check PTO has disengaged and warning light is out.

Put the tipper lever back in 'raise'. Then:

- rev the engine until the relief (overload) valve blows, i.e. until you hear a high pitched noise coming from the tipper valve (page 3)
- keep the engine revs going for five seconds
- lower the body (page 11).

If the body still will not come down, put the tipper lever in 'hold', PROP THE BODY, switch the PTO to 'out' and turn off the engine.

PROBLEM SOLVING

THE BODY STOPS ON THE WAY UP

Lower the body as slowly as possible. Then make sure:

- the body is not overloaded or badly distributed
- the oil in the tank is up to dipstick level (refer page 16)

THE BODY WILL NOT STAY UP WITH THE TIPPER LEVER IN 'HOLD'

Put the tipper lever back in 'raise and lift the body. Then:

- rev the engine until the relief (overload) valve blows, i.e. until you hear a high pitched noise coming from the tipper valve (page 3)
- keep the engine revs going for five seconds
- put the tipper lever in 'hold'

If the body still will not stay up, lower the body.

EXCESSIVE NOISE

- check the oil level
- check pipes for kinks and leaks

SPARE PARTS & SERIVCE

Use only genuine Edbro parts from Edbro service dealers. Refer to the online Dealer Locator at www.edbro.com for a full list of service dealers and distributors.

Always quote the component part number and serial number when ordering parts or seeking advice.

ANNEX 10

INSTRUCTIONS
FC & FE CYLINDERS
F.L.A.S.H. SERIES

For information regards operation, maintenance and safety, we advise you to register with www.hyva.com

The information within this guide is taken from the Hyva Hydraulics Recommendation leaflet which is supplied with your hydraulic tipping cylinder.
Information on mounting, operation, maintenance and safety can be obtained from Hyva direct.

Please register

Thank you for having our quality hydraulic tipping cylinder installed on your commercial vehicle. We ask you to register your company to become a member of our Hyva care program.
Just log onto www.hyva.com, fill in your company information and enjoy the benefits offered. Through this registration you will have:

- Direct access to product documentation such as users maintenance manuals.
- Detailed information on local sercie network and customised features in your own language.
- Download your maintenance card for your new vehicle and benefit from the advantages of using only Hyva certified partners.
- Continuous updates on new products and developments for your specific application.

Hyva's one stop philosophy

Besides cylinders, Hyva is a market leader for all hydraulic components required to operate your equipment. Our hydraulic tractor and tipper kits are engineered to give optimum safety, performance and return on investment. Combining the Hyva cylinder with Hyva hydraulics offers:

- Tailor made combination
- Best value for money
- One supplier, one contact, saves money
- Excellent Hyva after sales service

Keep your cylinder in good condtion: use a Hyva hydraulic kit

To optimise the efficiency and to operate the Hyva cylinder at minimal cost, we strongly recommend to use this cylinder with an original Hyva hydraulic kit.

The Hyva Power Take Off

The PTO on your truck is a critical item in the durability of the hydraulic installation. As it shifts straight into the gearbox it is vital to fit an appropriate and quality product. Our Hyva engineers are able to advise you and to select the correct PTO with appropriate torque and speed.

The Hyva tipping valve

Constructed with a pilot operated pressure relief valve with fixed pressure setting (cartridge), which protects cylinder and pump for overpressure. This tipping valve is designed to allow proportional lowering, which is of importance when lowering (half) loaded bodies. This valve can be directly fitted to the oil tank, which reduces the number of hoses and fittings and consequently the possibility of leakages. Additionally, the Hyva tipping valve is unique in the market as it has a peak pressure relief valve, to prevent serious damages in case of peak pressures. Using a low quality valve can cause major technical problems and in that case our warranty conditions do not apply.

The Hyva hydraulic pump

Designed to fit directly onto a gearbox mounted PTO and completely optimised for long life and high efficiency. The hydraulic pump range consists of gear-and piston pumps in

all necessary volumes, single and bi-rotational and with ISO standard 4-hole connection.

The Hyva oil tank
Hyva has a complete range of hydraulic oil tanks, both steel and aluminium. The design is fully adapted to the modern trucks and tractors. Our oil tanks are robot welded to secure the quality. All tanks are equipped with a 10 micron air breather filter, (and optionally a 25 micron return line filter with an efficiency of 98.7%)

The Hyva air control
The air controls are suited to control the tipping movement proportionally and optionally to controll the PTO, (optional with automatic PTO disengagement to make operation more efficient and to prolong PTO and pump life time).

Hydraulic oil
The hydraulic oil should be selected carefully. In general we recommend a hydraulic oil with a low viscosity. Optimal viscosity level at working temperature is between 36-16cST.
Of major concern in hydraulic systems is to prevent contamination of the oil by dirt and by water. That is why air filter elements should be replaced twice a year and oil filter elements once a year.

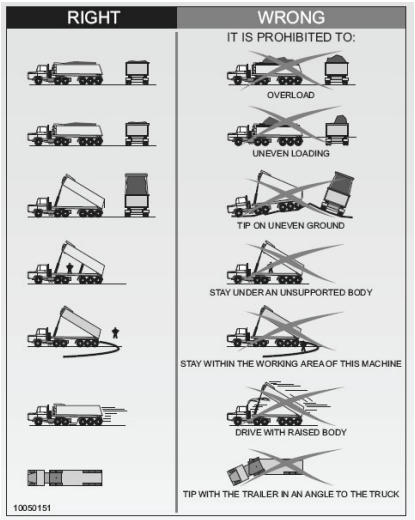
Hose burst valve
To avoid accidents that can occur because of a breaking hose (like the body dropping down), Hyva has designed a hose burst valve. This valve ensures that the oil flow is immediately blocked. The hose burst valve is equipped with a pressure relief valve to reduce damaging peak pressures in the cylinder.

Quick release couplings and adaptors
For all types of trailers and hydraulic systems Hyva can supply quick release couplings and adaptors. Both screw and push-pull models are available.

General
The tipping specialists at Hyva engineered many useful products such as the Hyva knock-off valve, Hyfix anti-rattling device, hydraulic tail door locking and Hyva Multi kap. Please visit www.hyva.com for more information.

Please be aware of the following issues in case you connect the cylinder to a truck with hydraulics source from a 3rd party.

- **Caution:** Check the maximum working pressure of the tipping valve in relation to the working pressure of the Hyva cylinder. Under pressure will lead to reduced tipping capacity. Over pressure can lead to serious damage to the cylinder and even personal injury. For cylinders damaged due to applying a faulty hydraulic kit our warranty conditions do not apply.
- Make sure the net oil volume of the tank and the oil level are sufficient. Insufficient oil can lead to a damaged pump and to dangerous situations.
- Make sure the installation runs on clean oil by fitting a filter and replacing the oil at regular intervals.
- The pump flow is important for the tipping speed. Make sure the pump fits the requirement of the cylinder.
- Please contact Hyva for further advice.



Make sure that you apply the supplied safety stickers on the truck. The safety stickers warn both the driver and people in the neighbourhood of the tipper.
You did not receive any stickers or need more? Contact Hyva or the nearest Hyva dealer.

Please visit **www.hyva.com** to see what other quality products Hyva has to offer such as:
Hyva Hook- and Skip Loaders | Hyva Cranes | Kennis Roll-Loader Cranes | Hyva Moving Floor Systems | DA-cylinders

!!! Please do not forget to register at **www.hyva.com** !!!

ANNEX 11 OPERATION & MAINTENANCE INSTRUCTIONS FOR MULDOON TYPE MANUAL ROLLOVER COVER SYSTEMS

Muldoon sheeting systems can be opened preferably from ground level or from a Health & Safety approved walkway following health and safety guidelines.

TO OPEN SHEET USING WINDING MECHANISM

1, Release side ratchet straps.
2. Loop 25mm sheet strap through the D ring on the centre ratchet strap.
3. Crank the winch-winding handle to spool the webbing strap from the central drive pole turning until the sheet is rolled across the vehicle.

TO OPEN SHEET USING FRONT DRIVE

1. Release side ratchet straps.
2. Loop 25mm sheet strap through the D ring on the centre ratchet strap.
3. Climb the safety ladder, once in position on the walkway, locate the front winding handle in the pole drive.
4. Roll sheet across the body to the fixed side and remove the winding handle.

TO OPEN SHEET USING REAR DRIVE

1. Release side ratchet straps.
2. Loop 25mm sheet return strap through the D ring on the centre ratchet strap.
3. Release rear winding handle from storage brackets.
4. Adjust the handle to the length required to reach the winding pole.
5. Locate nose cone of rear handle and in the rear drive of the pole.
6. Roll the sheet across the vehicle to the fixed side and remove the winding handle.
7. Return handle to stowage brackets.

TO CLOSE THE SHEET

1. Pull the sheet return strap from ground level until sheet has fully closed.
2. Remove return strap from D ring on centre ratchet strap.
3. Insert webbing straps into ratchets and tension down.

MAINTENANCE

Inspect Sheet DAILY for wear or damage and repair or replace if required.

Check side ratchet webbing DAILY for any signs of wear and tear.
Operators should also check pull back webbing for wear, especially where it is pulled over the top rail.
Replace immediately any straps which are cut, worn or frayed.

Regularly check, clean and lubricate the ratchets along the side of the body.

Regularly check, clean and lubricate the universal joint on the rear winding handle.

IMPORTANT

- ALWAYS open sheet, where possible, before tipping to avoid the risk of a vacuum forming and centre pole being bent.
- DO NOT open or close sheet while vehicle is moving or in high winds.
- DO NOT operate system whilst tipping.
- DO NOT travel with the sheet in the open position.

HYDROCLEAR

Operating, Maintenance and Warranty Instructions

TO OPEN SHEET

Press open switch on sheeting system, control panel/ remote control until sheet has fully rolled over body to fixed side and is situated on top rail of vehicle.

TO CLOSE SHEET

Press close switch on sheeting system control panel/ remote control until sheet has fully rolled back over body to open side and the straps are completely tensioned down.

IMPORTANT

- ALWAYS open sheet, where possible, before tipping to avoid the risk of a vacuum forming and centre pole being bent.
- DO NOT open or close sheet while vehicle is moving or in high winds.
- DO NOT operate system whilst tipping.
- DO NOT travel with the sheet in the open position.
- DO NOT operate system if load is above height of front/ rear domes or maximum extension of load lifter arms, if fitted.
- WHEN WELDING BODYWORK, the remote control receiver plug must be disconnected from the hydraulic powerpack.

MAINTENANCE

Inspect sheet DAILY, for wear or damage and repair or replace if required.

Check tension straps DAILY for any signs of wear and replace immediately if straps are cut, worn or frayed.

Check oil level MONTHLY, which should be 50mm below filler point. DO NOT OVERFILL

Change oil every 12 MONTHS Oil type TOTAL AZOLLA Z S 46

Inspect stainless steel plate on front corner of body, plastic sheet on front and rear domes, and replace either if worn.

Check all hose connections and fittings, for tension and leaks, inspect nylon blocks and pulleys and replace if worn

TROUBLE SHOOTING

If the system is not operating correctly:

Check fuse in the Powerpack and the 150 amp fuse in the Battery Box

Check for obstructions on top of the body stopping the sheeting system operating

Check that there is no damage to the centre and side poles

Check that the oil level is correct

Check the webbing straps are not damaged and are running freely

WARRANTY *(Please also refer to our detailed terms and conditions of sale)*

1 Years Warranty on all parts for fair wear and tear (For warranty on parts of the system please call 01945 461741)
Return faulty part to Dawbarn & Sons for inspection and warranty claim (*A replacement will be sent within 24 hours*)

ALL PARTS WILL BE SUPPLIED FOC IF THEY HAVE FAILED UNDER WARRANTY PERIOD WITH FAIR WEAR & TEAR

Do not alter factory prepared settings on Powerpack.
Do not attempt to repair or take apart motors or Powerpack as this may invalidate your warranty.

PARTS MUST ONLY BE REPLACED WITH ITEMS SOLD AND APPROVED BY DAWBARN & SONS Ltd.

DECLARATION OF CONFORMITY

Parent Company Name :	The Wire-Watcher Co.Ltd
Parent Company Address:	Gigg Mill, Old Bristol Road Nailsworth GL6 0JP UK
Manufactured by:	BW Electronics, Knightsbridge Cheltenham

Declares that the Product…

Product Name:	'Wire-Watcher 2'
Model Ref:	'WW2'

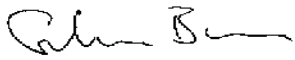
Conforms to the following Product Specifications…

EMC Directive: 89/336/EEC – Electromagnetic Compatibility

Low Voltage Directive (LVD): 73/23/EEC

…& carries the 'CE' marking accordingly.

Signed for & behalf of, The Wire-Watcher Co.Ltd



Graham Barr
Director

1 September 2004 *(latest amendment)*

WIREWATCHER - EXTERNAL MODULE
for use on tipping trailers

The WireWatcher External Module is designed to work in conjuction with other control equipment to provide a warning of the presence of High Voltage Overhead Cables

For a self powered tipping articulated trailer, it is powered from the donkey engine / power pack ignition which when switched on, the WireWatcher starts to detect.

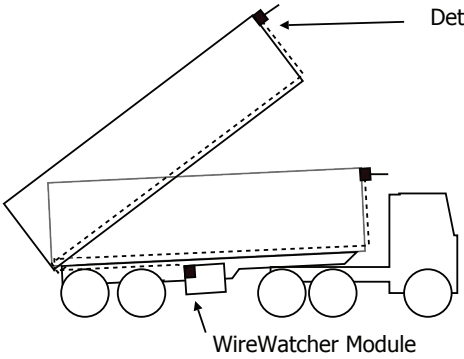
The aerial will be mounted at the highest point of the trailer, both when in transport position & when tipped. This guarantees the best detection coverage

External outputs may be wired to an external audible or visual alarm which activate when an overhead cable is detected

OPERATION:
When powered up, the WireWatcher power light illuminates green (but may turn red immediately if a power cable is detected). The outputs are also energised momentarily to allow testing of the outputs (if connected)

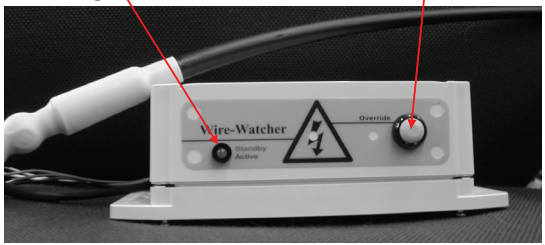
When a cable is detected, the power light turns from GREEN to RED & the outputs will be energised causing any beacon or warning sounder to operate

If a sounder is used, pressing the override button will mute the unit, but will activate the secondary output on which a flashing light may be connected. This will continue to warn the operator of possible risk until the WireWatcher is powered down, or if the detected power cable is disconnected



Power Light
Green - stand by
Red - Warning

Override Button
Mutes alarm



MULDOON

VR113, 142, 160 & 170 BLOWERS

Recommended Lubrication, Oils & Greases

VR 113 | 142 | 160 | 170 BLOWER

LUBRICATION

Drive end (front) lubrication recommended grease Shell Gadus S3V220C2.

The two end caps and roller bearings at drive end are pre packed ONE THIRD full with grease before despatch from the works.

Lubrication Schedule for Muldoon Blower

	Recommended Grade	1st Fill Up	Replacement	Level Check
Oil	Servo Mesh SP460	Up to Level	60 days	Daily
Grease	Shell Gadus S3V220C2	1/3 END Cap	4 weeks	Weekly

RECOMMENDED GREASE EQUIVALENT CHART

Witmans Petrochem Ltd	Hindustan Petroleum Corporation Ltd	Bharat Petroleum Corporation Ltd
HIGH TEMP GREASE	HP-TISONA-2	SERVO GEM-2

RECOMMENDED GREASE QUANTITY

MODEL 113/ 142/ 160/ 170
WEIGHT 40 gms

MULDOON

GEAR END (REAR LUBRICATION) LUBRICATION RECOMMENDED OIL-SERVOMESH SP460.

THE GEARS AND BEARINGS AT THE GEAR END ARE SPLASH LUBRICATED BY OIL. BLOWERS ARE DRAINED OF OIL BEFORE DESPATCH AND SUMP MUST BE FILLED, BEFORE ATTEMPTING TO OPERATE THE UNIT.

TO FILL THE UNIT WITH OIL, REMOVE THE BREATHER IN ELBOW AND OIL FILL PLUG. POUR LUBRICANT INTO THE UNIT, UNTIL IT FLOWS FREELY FROM THE OIL LEVEL HOLE. A SHORT TIME SHOULD BE ALLOWED TO ENABLE THE SURPLUS OIL TO ESCAPE AND THEN PLUG WITH ITS WASHER AND THE BREATHER SHOULD BE REPLACED. IT IS VERY ESSENTIAL TO MAINTAIN THE CORRECT LEVEL OF OIL, BECAUSE EXPERIENCE HAS PROVED THAT EXCESSIVE OIL AS WELL AS LESS OIL CAUSES OVERHEATING OF THE BLOWER RESULTING IN, UNACCCEPTABLE TEMPERATURE RISE IN BLOWER.

RECOMMENDED OIL EQUIVALENT CHART

1.	INDIAN OIL CORP. LTD.	SERVOMESH SP 460
2.	HINDUSTAN PETROLEUM CORP. LTD.	PARTHAN EP 460
3.	AMERICAN GEARS MANUFACTURING ASSOCIATION.	AGMA 7EP
4.	CANADA PETROCHEM (CP)	ULTIMA 460
5.	SHELL	OMALA 460
6.	BHARAT PETROLEUM CORP. LTD.	AMOCAN 460
7.	PANAMA PETROCHEM LTD. (PPL)	GEAR LUBE SP 460

QUANTITY OF RECOMMENED OIL

BLOWER GEAR C.D.	BLOWER MODEL	QUANTITY OF OIL	
		HORIZONTAL AIRFLOW	VERTICAL AIRFLOW
152.4 MM	SR VR 113/142/160/170	2250 ML	2750 ML

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Trailer
"Stability Weigh"
User Manual

September 2012
Version 1.2

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880
www.onboardweighing.co.uk

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

This handbook is intended as a guidance note for operators of trailers fitted with the Barry Napper and Co ***"Stability Weigh System"***.

The system has been designed as an aid to the vehicle operator to enable him or her to undertake safe and accurate discharge (tipping) of a load when on a delivery site.

This booklet covers the following areas:

- ZERO and SPAN Calibration of the Weighing Instrument
- Setting of the Load and Unload alarm
- Use of the Mobile Phone App – powered by *Bluetooth*® wireless technology
- The safety system master switch
- The electro-pneumatic valve used to restrict the body being raised in a particularly hazardous scenario.
- The various safety trigger levels associated with this system
- Trouble shooting guide

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Rinstrum N420 – K401 Calibration Instructions

To undertake a zero calibration the body must be empty

- Press and hold the **POWER** key and the *F3* key, the display will eventually show 9En_OPt
- Press the **ZERO** key display show H.!'ArE
- Press the **ZERO** key again display show SCALE
- Press the **TARE** key display show bUI Ld
- Press the **TARE** key again display show OPt! On
- Press the **TARE** key again display show CAL
- Press the **GROSS/NET** key display will show 2Er0
- Press the **OK** key on the numeric key pad on the right hand side
- The display show a random weight in kg on the upper screen and CONt ? on the lower screen
- Press the **OK** key display will show 2 in P, the display will show 0.000 on the main screen and dOnE in the lower screen.
- Press the **OK** key, display will show 2Er0 on the main screen.
- Press the **POWER** key, the display will return to normal weighing

To undertake a loaded (SPAN) calibration load with a known weight (from a weighbridge)

- Press and hold the **POWER** key and the *F3* key, the display will eventually show 9En.OPt
- Press the **ZERO** key display show H. !'ArE
- Press the **ZERO** key again display show SCALE
- Press the **TARE** key display show bUI Ld
- Press the **TARE** key again display show OPt! On
- Press the **TARE** key again display show CAL
- Press the **GROSS/NET** key display will show 2Er0
- Press the **GROSS/NET** key display will show SPAn
- Press the **OK** key on the numeric key pad on the right hand side
- The display will show a totally random weight in kg
- Press the **OK** key and the display will show a !'E ,9ht on the upper section and the lower section (smaller digits) will show a weight in digits.
- Using the **NUMERIC KEYPAD** type in the known payload of the vehicle in full, for example if the payload is 19,780kg, using the numeric pad type in 19.780, with no spaces or gaps, please ensure the decimal point is included. The weight entered will appear on the lower screen.
- Press the **OK** key display will show S in P, the display will show the weight you have just entered on the main screen and dOnE in the lower screen.
- Press the **OK** key, display will show SPAn on the main screen.
- Press the **POWER** key, the display will return to normal weighing

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Rinstrum N420 – K401 Load Alarm Setting Instructions

- Press and hold the ***F3*** button, the display will show ***LOAd*** on the upper screen and a weight on the lower screen

- Enter the target load weight (include the decimal point) using the **NUMERIC KEYPAD** on the left side of the instrument.
- Press the **OK** button twice and the instrument will return to normal weighing.
- Once the loaded target weight has been obtained and the alarm is sounding, a short press of the ***F3*** button will silence the alarm.
- To reactivate the alarm for the next load press the ***F3*** button if the same target weight is required a single press of the **OK** button will reactivate the alarm and return the instrument to normal weighing. If a different target weight is required follow the steps above

Rinstrum N420 – K401 Unload Alarm Setting Instructions

- Press and hold the ***F3*** button, the display will show **LOAD** on the upper screen and a weight on the lower screen.
- Press the **UP ARROW** ▲ on the numeric keypad and the display will show ***UnLOAd*** on the upper screen and a negative weight on the lower screen.

- To amend the unload alarm setting trigger point enter the unload target including the decimal point using the **NUMERIC KEYPAD** (for example two and half tonnes would be -2.500kg), add a minus symbol by pressing the **+/-** on the **NUMERIC KEYPAD**.
- Press the **OK** button twice and the instrument will return to normal weighing.
- Raise the body and press the **TARE** button even though the vehicle is loaded the display will show 0.000kg.
- Commence unloading, the display will show a negative weight and the word **NET** in small text on the left side.
- When the unload target weight is obtained the alarm will sound.
- To return the instrument to normal weighing press the **GROSS/NET** button, the display will show the weight of material remaining in the body.
- If a further delivery from the same load is required repeat the steps above.

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Rinstrum N420 – K401 (Tilt Sensor) Mobile Phone App Operation Instructions

This vehicle is equipped with a mobile phone capable of reading the weighing instrument and integral tilt sensor via a *Bluetooth*® wireless technology.

- On the 1st use of the mobile phone, the *Bluetooth*® wireless adapter will ask the operator to accept a pairing request from a device that will be named *"BNC ???"* please accept this request, if a password is requested please enter 1234.
- For the fastest connection time start the application by pressing the left selection key (or from the menu selecting ***Apps***. – ***Extras*** – ***Collection*** – scroll to ***OBW_Tilt420 Server*** from the list and open using the square central button) before powering the instrument *(ignition controlled on rigid vehicles and side light controlled on trailers)*. The application may ask for the operator to press the central square button to accept connectivity, please do so.
- The application will then start searching for a paired adapter. It will find the adapter, connection usually takes between 30 secs and 2 mins (speed of connection is affected by the number of other mobile phones with active *Bluetooth*® wireless connectivity within 50 metres).
- Once connected the phone will show the information as on the graphic above, when the **side** reading on the tilt sensor exceeds side 2.5° the phone will vibrate and beep indicating to the operator that caution must be exercised.

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Safety Control Systems Master Switch

The Safety System Master Switch activates and deactivates all of the safety control systems on this trailer.

In order to raise the body push the switch to the **ON** position (the LED in the top of the switch will illuminate) all of the safety systems become active.

THE BODY CAN ONLY BE RAISED IF THE SWITCH IS IN THE "ON" POSITION.

To prevent to the flash tone from activating when travelling on the public highway it is suggested that the switch is turned to the **OFF position** before leaving site (the LED will be extinguished)

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Tilt Trailer 3.5° Safety Control Enclosure

The body will only raise if this LED is illuminated.

Please check the LED is illuminated before **loading** and **unloading** the trailer

IF THE LED IS NOT ILLUMINATED DO NOT ATTEMPT TO LOAD THE TRAILER

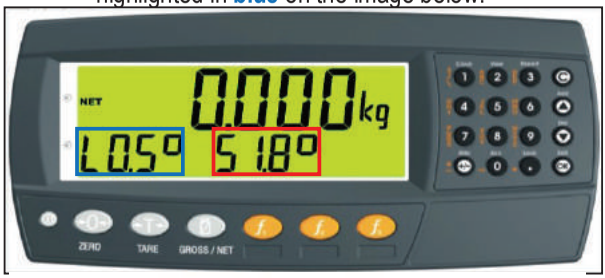
The LED will extinguish when the trailer exceeds 3.5° side to side tilt

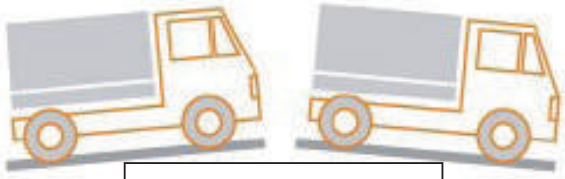
Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Tilt Sensor SAFE Operation Instructions (revision 1.1)

This trailer is fitted with a tilt sensor integrated into the weighing system display. The tilt sensor reads two sets of incline readings. The side to side or "S" degrees of slope highlighted in **red** on the image below and the front to back or "L" degrees of slope, highlighted in **blue** on the image below.





Long or L degree incline

If the "UnStAbLE" message appears on the screen **ONLY WHEN** the L **degree** reading exceeds 2.5° do not panic, there is no significant risk of overturning. Beware of ground conditions, continue with the load discharge. None of the safety systems will be triggered by excessive L degrees of incline or slope.

Side or S degree incline

If the "UnStAbLE" message appears on the screen when the **S degree** reading exceeds 2.5° **only proceed with extreme caution.**

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Side or S degree incline

There are three extremely important trigger levels associated with this system, the safety triggers are only activated by the **"S" (side) degrees of slope**.

When the chassis is placed in a position exceeding 2.5° of slope either **front to back** or **side to side** the instrument will make the driver aware of the slope by alternating between **"UnStAbLE" and the relevant degrees. PLEASE DO NOT PANIC**. The **UNSTABLE** text appears on screen to ensure the vehicle operator exercises caution in proceeding with the load discharge. If the UNSTABLE message is triggered **only** by the front to back (L) degree reading there is no significant risk, proceed as normal, please be aware of ground conditions.

If the **UNSTABLE** message is triggered by the side to side degree reading much more caution should be exercised. The safety triggers from the side to side degree reading are detailed below. As each trigger level is exceeded the weighing instrument will display **UNSTABLE** and activate one of the safety devices detailed below:

- 2.5° The round **green strobe light** located near the swan neck of the trailer will begin to flash, warning the driver that a potentially risky tipping zone has been entered.
- 3.0° The **audible warning** located inside the strobe light will start to sound advising the driver to lower the body and reposition the trailer.
- 3.5°The **tipping ram will not lift** if the "S" degrees exceed 3.5°, if the"S" degrees do exceed 3.5 reposition the trailer to somewhere on the site with a much lower level of "S" slope.

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Stability Weigh Trouble Shooting Guide

- **If the Weighing Instrument is not powered up?** turn on the trailer side lights, the instrument should come on automatically, if the instrument does not power up press the small round power button on the extreme left.

- **If the body will not raise?** Check the weighing instrument is powered up, if yes, turn on the main outdoor switch, the locator LED inside the switch will illuminate when the switch is activated. If the body will still not raise check the LED on the electro-pneumatic valve box (usually located on the outside of the chassis) is illuminated, if this LED is illuminated the body should lift. If the body will still not lift please ring Barry Napper and Co 01427 875 574

- **UNSTABLE** appears on the weighing instrument and mobile phone, both are alternating between the degree reading and **"UNSTABLE"**, check which degree reading is exceeding 2.5°. If ONLY the **"L"** (front to back) degree reading exceeds 2.5° proceed with load discharge, be aware of the ground conditions but there is no significant risk to stability.

- **Green Strobe is illuminated and UNSTABLE** is visible on the weighing instrument and mobile phone. The chassis is at or has exceeded 2.5° of side to side slope. **PROCEED WITH EXTREME CAUTION.**

- **Siren is sounding and Green Strobe is illuminated and UNSTABLE** is visible on the weighing instrument and mobile phone. The chassis is at or has exceeded 3.0° of side to side slope. Immediately lower the body, reposition the trailer to a more suitable location to discharge the load, preferably a situation in which the green strobe light is not illuminated.

- **Body will not raise, Siren is sounding and Green Strobe is illuminated and UNSTABLE** is visible on the weighing instrument and mobile phone. The chassis is at or has exceeded 3.5° of side to side slope. If the body is raised, **lower it as a matter of absolute urgency**, reposition the trailer and restart discharge. If the body has not been raised, reposition the trailer to a suitable discharge location preferably in which the green strobe is not illuminated.

- E000 1 appears on screen. Waggle the side and marker light suzi from the tractor unit and if required sparingly spray the contacts with contact oil. If problem not solved please ring Barry Napper and Co 01427 875 574

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

This handbook is intended as a guidance note for operators of vehicles fitted up with the ***"Stability Weigh"*** system. If you the operator have any difficulties with the system please do not hesitate to contact Barry Napper and Co.

We at Barry Napper and Co would welcome constructive feedback on the future content of this handbook.

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing, Commercial Vehicle Bodies and Easy Sheets

Woodhouse Grange Farm
Belton Doncaster DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

ZERO and SPAN Calibration Instructions R320 Indicator

To Zero the Display

- Press the f and POWER KEY at the same time holding both for 2 seconds. The Display will beep twice and then show SETUP
- The display will then show bUiLd
- Press ZERO — Display will show OPtiON
- Press ZERO again — Display will show CAL
- Press TARE — Display will show ZErO
- Press GROSS/NET — Display will show weight approximately 0.000
- Press Print — Display will show Z. in P, when complete will show 0.000 exactly
- Press the Zero button eight times until the display shows –END-
- Press f — Display will return to normal weighing

Load vehicle, weigh the vehicle at a weighbridge obtaining the NETT Payload

TO SPAN the vehicle

- Press f and POWER KEY at the same time holding both for 2 seconds. The Display will beep twice and then show bUiLd
- Press ZERO — Display will show OPtiON
- Press ZERO again — Display will show CAL
- Press TARE twice — Display will show SPAN
- Press GROSS/NET — Display will show a weight, if this weight needs adjusting:
- Press GROSS/NET again — The display will show a **flashing** digit
- Press GROSS/NET again — To move the flashing along the line of digits
- Press Print — To adjust the flashing digit between 1 and 9, when the correct digit is shown
- Press GROSS/NET again — To move the flashing digit across, repeat the above step until the correct weight is shown on the display. When the correct weight is shown
- Press f — Display will show S. in P then flash with the correct weight
- Press the Zero button eight times until the display shows –END-
- Press f — Display will return to standard weighing mode

If you experience any problems please call us using 0044 1427 875574

www.onboardweighing.co.uk

Barry Napper & Co.
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Bodies

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

Calibration Instructions X320 Indicator

Prior to attempting to set the instrument ensure the button area is clean and dry

To Zero the Display, lift the body to normal weighing height – (6-8inches above the chassis)

- Press GROSS/NET and POWER key at the same time holding both for 3-4 seconds. The display will beep twice and then show SETUP
- The display will then show **bUiLd**
- Stroke ZERO — Display will show **OPtiON**
- Stroke ZERO again — Display will show **CAL**
- Stroke TARE — Display will show **ZErO**
- Stroke GROSS/NET — Display will show a weight
- Stroke Print — Display will show **Z. in P**, when complete will show **0.000kg** exactly
- Stroke the Zero button eight times until the display shows **–END-**
- Stroke f — Display will return to normal weighing

Load and weigh the vehicle at a weighbridge, obtaining the NETT Payload, lift the body to weighing height (6-8inches above the chassis)

- Stroke GROSS/NET and POWER KEY at the same time holding both for 3-4 seconds The Display will beep twice and then show **bUiLd**
- Stroke ZERO — Display will show **OPtiON**
- Stroke ZERO again — Display will show **CAL**
- Stroke TARE twice — Display will show **SPAN**
- Stroke GROSS/NET — Display will show a weight, if this weight needs adjusting
- Stroke GROSS/NET again — The display will show a **flashing** digit on the left side
- To move the flashing digit along the line of digits stroke GROSS/NET, to adjust the flashing digit between 1 and 9, stoke PRINT, move along using GROSS/NET, use PRINT to adjust only the flashing digit, when weight shown on the display matches the known payload Stroke **f** Display will show S. in P then flash with the correct weight.
- Stroke the Zero button eight times until the display shows –END-
- Stroke f Display will return to standard weighing mode

If you experience any problems please contact us on 01427 875574
www.onboardweighing.co.uk

Barry Napper & Co
Engineers
The Specialists in On-Board Vehicle Weighing and Commercial Vehicle Body Repairs

Woodhouse Grange Farm
Belton · Doncaster · DN9 1QH
Telephone: 0044 (0) 1427 875574
Facsimile: 0044 (0) 1427 875880

www.onboardweighing.co.uk

Transport Support

TS Heavy Duty 8 Sensor Parking System

Installation and Operating Instructions

CE

133

- **PREFACE**

Thanks you for purchasing our 8 Sensor Heavy Duty Vehicle Parking System, with this system you can park your vehicle with confidence and peace of mind. Activated automatically, it alerts you when you are close to another vehicle, wall or person, providing a safe, easy parking experience in all situations.

⇨ **Suggestion**

- Read this manual thoroughly before installation and use, please pay particular attention to all of the precautions and instructions listed in the manual and marked on the product.
- It is recommended that installation is carried out by professional personnel.

⇨ **Notice**

- This manual only describes in principle the functions, installation, usage and precautions of the parking sensor system.
- Designs and specifications are subject to change without prior notice.
- It may happen that diagrams or pictures in this manual are different to the real product.

- **Product Profile**

⇨ **Overview**

- This parking sensor system is an intellectual safety aid that is an integration of functional piezo-ceramic, ultrasonic, electronic, computer data processing and other technologies. Incorporating the principle of ultrasonic distance measurement and the technology of fuzzy processing of computer data, it correctly detects obstacles behind the vehicle and warns the driver with clear audio and visual signals, thus protecting the vehicle against colliding with obstacles.

⇨ **Features**

- Top sensitivity: a person around 1.3 ~ 1.7m behind vehicle can be detected with fast reaction.
- Min. detection and display distance: 22cm
- Wide detection angle with minimal blind area.
- **0°** viewing angle of jitter free LCD display for minimized false alarm, showing warning zones, distance to and direction of obstacles.
- Diagnostic function alerts you of defective sensors, if any.
- Workable under very bad weather conditions (e.g. heavy rain, snow, strong wind or high temperature)
- Highly reliable and interference resistant based on optimized design and the use of high quality components, so the system typically outlives the vehicle.

- **SPECIFICATION**

No.	ITEM	Rating
1	Working Voltage (VDC)	10~28V (Rated Voltage = 12v
2	Rated Current (max)	150mA
3	Sensing Distance (m)	0.22 ~ 2.5
4	Blind Area (m)	<0.22 at 25°
5	Warning Modes	Sound, Distance, Zone, Direction
6	Display	LCD
7	Working Temperature	-30°C ~ 70°C
8	Storage Temperature	-35°C ~ 80°C

- **PRODUCT COMPOSITION**

The system mainly consists of the following 4 units.

- **2 x Electronic Control Unit (ECU)** - This incorporates a micro-computer control system and a signal processing circuit.
- **Detection Unit** - 8 x ultrasonic sensors
- **Warning Unit** - When vehicle reverses, this unit warns the operator of obstacles in different ways: sound, warning zones, distance to and direction of obstacles.

⇨ **In use warning mode**

The system beeps when an obstacle is within the warning zone

Warning Zone	Distance	Audible Warning
Danger Zone	<0.22m 0.22 ~ ≤0.3m 0.3 ~ ≤0.4m	Bi Bi.Bi.Bi.Bi Bi..Bi..Bi..Bi..
Caution Zone	0.4 ~ ≤0.6m 0.6 ~ ≤0.8m 0.8 ~ ≤1.0m	Bi...Bi...Bi...Bi… Bi….Bi….Bi….Bi…. Bi…..Bi…..Bi…..Bi…..
Safety Zone	1.0 ~ ≤1.7m 1.7 ~ 2.0m	Bi…..Bi…..Bi…..Bi……

Note: When obstacles appear behind the 2 rear side sensors (number 5 and 6), the system doesn't beep unless they are in the Caution and Danger zones.

⇨ **Indication of distance and zones**

Warning Zone	Distance	Distance Indication
Blind Zone	<0.22m	-P- or STOP
Danger Zone	0.22 ~ ≤0.5m	Numeric display in digits
Caution Zone	0.5 ~ ≤1.1m	Numeric display in digits
Safety Zone	1.1 ~ ≤1.8m	Numeric display in digits
	1.8 ~ ≤2.5m	Numeric display in digits

⇨ **Warning mode for LCD Display**

The LCD display has a built in buzzer enabling the operator to know the exact warning zone distance to and direction of the obstacle.

- Direction Symbol - This flashes to indicate which sensor has detected an obstacle thus visually showing the exact direction of the nearest obstacle if there is more than one.

- Audible Alarm - The warning volume is adjustable with a switch on the back of the display. It has three positions, High, Low and Off.

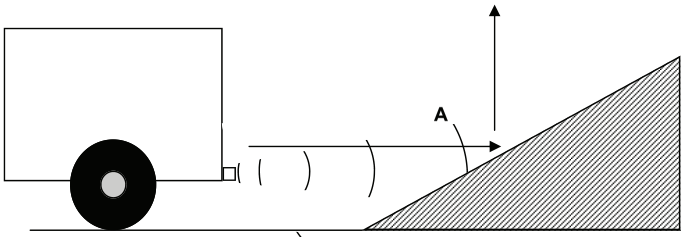
⇨ **About detection**

Incorporating highly sensitive ultrasonic sensors and computer data fuzzy processing technology gives this system minimal blind areas and greater detection range. However, the detection results may vary depending on the mounting position of the sensors and the wave reflection for an obstacle.

The following are some examples of abnormal detection:

- An unusual reflection angle of an obstacle may give rise to a distorted detection reading.

1) Point 'A' may not be detected due to unsatisfactory reflection angle.



⇨ **Warning mode for LCD Display**

The LCD display has a built in buzzer enabling the operator to know the exact warning zone distance to and direction of the obstacle.

- Direction Symbol - This flashes to indicate which sensor has detected an obstacle thus visually showing the exact direction of the nearest obstacle if there is more than one.

- Audible Alarm - The warning volume is adjustable with a switch on the back of the display. It has three positions, High, Low and Off.

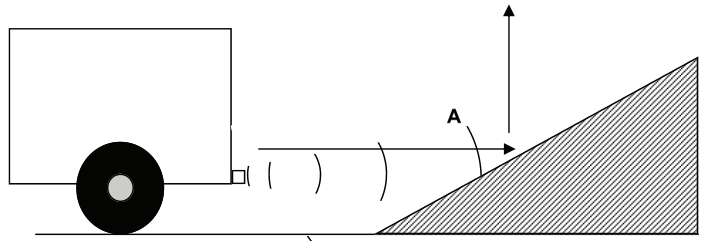
⇨ **About detection**

Incorporating highly sensitive ultrasonic sensors and computer data fuzzy processing technology gives this system minimal blind areas and greater detection range. However, the detection results may vary depending on the mounting position of the sensors and the wave reflection for an obstacle.

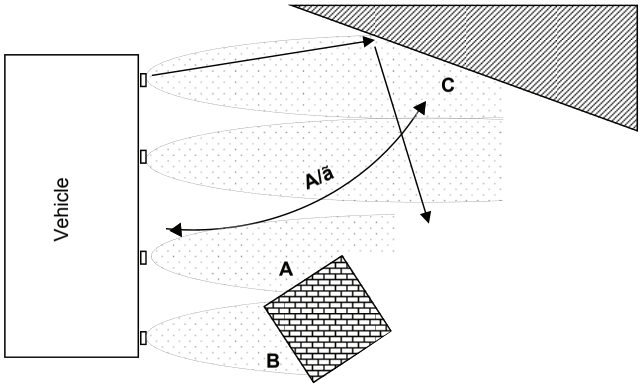
The following are some examples of abnormal detection:

- An unusual reflection angle of an obstacle may give rise to a distorted detection reading.

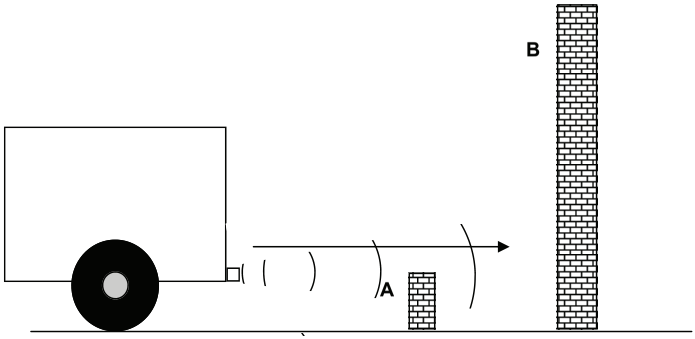
1) Point 'A' may not be detected due to unsatisfactory reflection angle.



2) Surface ‘A’ is closer to the sensor than surface ‘B’, but surface ‘B’ has a better reflection. As a result suface ’B’ is detected first, whereas surface ’A’ may not be detected. If surface ’C’ has a smooth glass like surface and angle ’A’ is very wide this obstacle may not be detected.



3) Low obstacle in front of a tall one. Although obstacle ‘A’ is lower than the sensors it may be detected first because the reflection received by the sensors is strongest. When obstacle ‘B’ comes closer to the vehicle and its reflection be comes stronger then that obstacle will be detected.



4) It is hard for the system to detect obstacles that strongly absorb sound waves such as sponge and fabric.

140

⇨ Precautions

- When this system is working the reverse speed must be under 5km/h.
- Make sure that the sensors are stable and mounted in the correct position.
- Keep the sensors clean and remove any dirt from their surface.
- If a sensor is found to be damaged it should be replace imeadiatly.
- After installation a full test should be carried out.

⇨ Installation

- The systems has a two ECU's (one grey waterproof box and one black box) The grey waterproof box should be mounted at the rear of the vehicle close to the reverse lights and the smaller black box should be mounted in a secure location under the dash.

- The warning display should be mounted in the cab where it can be clearly seen by the driver. An adhesive mounting pad is supplied.

- The sensors are supplied with heavy duty mounts these can be fitted either above or below a flat surface. Note: The rear of each sensor is marked "⇧UP" this arrow MUST point upwards for the system to function correctly.

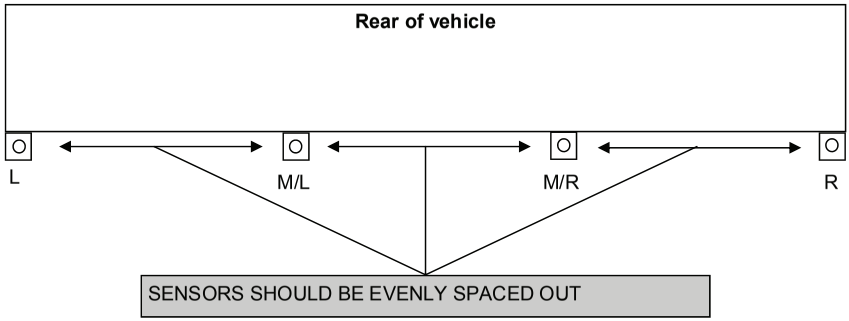
- **The detection results may be affected if sensors are mounted in steel bumpers.**

- The individual sensors are clearly marked as follows

L M/L M/R R

L= Left
M/L = Middle Left
M/L= Middle Right
R = Right

Sensors should be mounted as below...



⇨ **Wiring**

- The electrical connections to the system are very simple but must be correctly connected to prevent damage.
- Connect the BLUE wire from the rear ECU and the black wire from the front ECU to the vehicles ground (0v)
- Connect the BROWN wire to the vehicles reverse Light +V. This wire will go to +12v or +24v (depending on the working voltage of the vehicle) when the vehicle is put into reverse gear.
- Connect the YELLOW wire from the switch along with the RED wire from the front ECU to a ignition switched +12/24v supply.

Using a SUZI connection.

- If your system has been supplied with a SUZI kit for use with an articulated vehicle you should have the following extra components.

  1 x SUZI Cable
  2 x SUZI Connectors
  1 x Fixing Kit

Mount connector to the rear of the tractor unit and mount the other connector to the front of the trailer. The connection points within the sockets are marked with numbers. Connection of the cables should be like for like at on each side.

i.e. pin 1 on the tractor side should match pin 1 on the trailer side.

Example of 6 pin SUZI connections (same for Tractor and Trailer connectors):

Pin1 -	Screen	Pin6 -	Not Used
Pin2 -	Green		
Pin3 -	Brown		
Pin4 -	Red		
Pin5 -	White		

⇨ Trouble Shooting

PROBLEM	REASON	SOLUTION
System doesn't react reverse is engaged.	• System is not powered up or wrong connection of power cable. • Invalid connection between display and control unit.	• Check if the power cable to the control unit is well connected to the +V of the reverse light. • Check that the connection between the display and control unit are correct.
After activation the system continuously beeps for 3 seconds.	• Invalid connection between sensors and control unit. • All sensors are defective.	• Check the connection between the sensors and control unit. • Replace the defective sensors.
The display distance remains the same while distance to obstacle varies.	• Wrong Installation direction of sensors • Wrong installation angle of sensors	• Follow the 'UP' mark on the rear of the sensor and re-install • Adjust the position of the sensor and the detection angle.
There is no obstacle in detection range but the display always shows "-P-" or "STOP" and the system beeps.	• A sensor is not securely fixed or have been over tightened. • The system is detecting the vehicle its self or attached parts	• Check if the sensor is well fixed in their mount. • Adjust the position of the sensor and the detection angle.
Wrong indication of direction	The marker on the sensor does not match the socket on the lead or the sensor is mounted in the wrong position.	Check mounting position and re-connect.
The display doesn't work when the vehicles other lights are on.	Wrong connection of control units ground power cable (BLUE)	Connect the BLUE 0v cable from the control unit to the correct Ground 0v of the vehicle.

VUE Reverse Camera Kit Specification

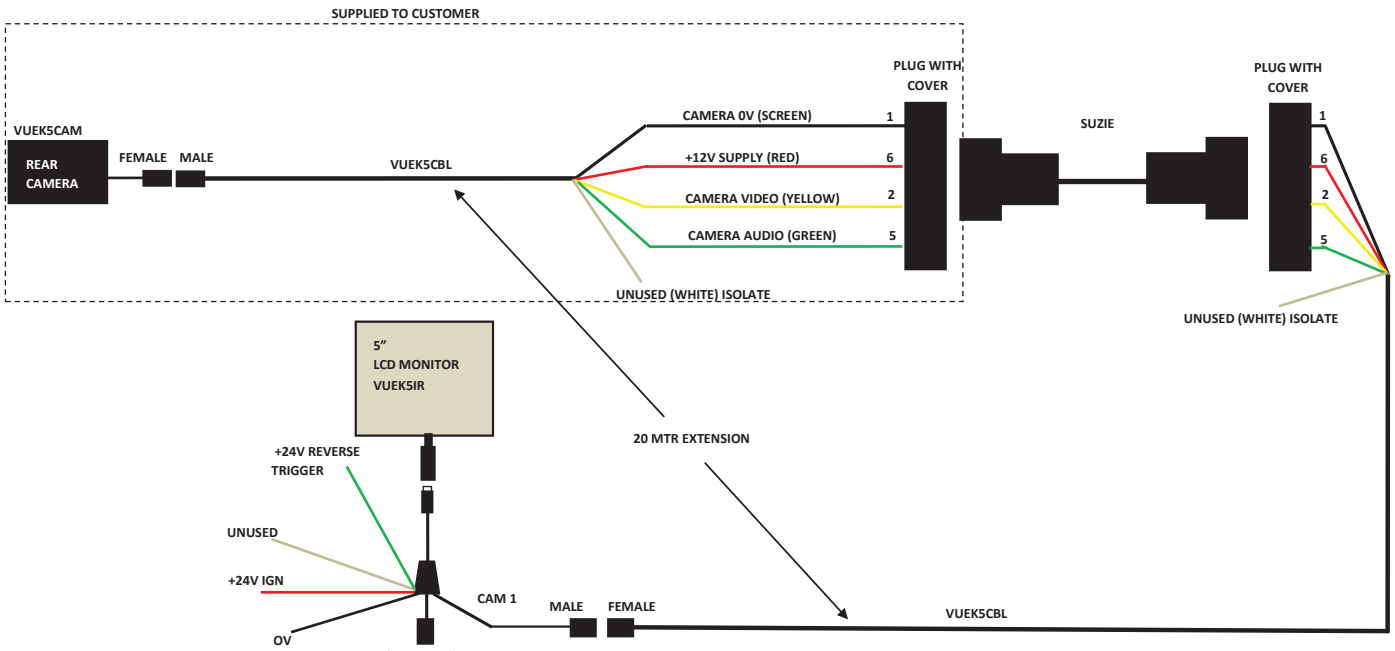
A complete reverse camera kit complete with 5 ” LCD Monitor, IR Camera and cable.

VUEK5IR

MONITOR

LCD Profile Wide-Screen Ratio	5 inch (4:3)
Interface	Digital
View Angle (U/D/L/R)(CR>10)	50/70/70/70
Brightness (cd/m^2)	200
Contrast Ratio	500 : 1
Response Time (ms)(at25ºC)	15
Power Requirements	12/24V DC
Power Consumption	≤5W
Operating Temperature Range	-20ºC to +70ºC
Storage Temperature Range	-30ºC to +80ºC
Dimension	147mm (L) x 110mm (W) x 59mm (D)
Weight	400g (excluding mounting bracket)

Vision Unique Equipment
Unit 7, Ashburton Park, Trafford Park, Manchester, M17 1EH
00 44 (0)161 877 2257 www.vue-cctv.co.uk info@vue-cctv.co.uk


SUPPLIED TO CUSTOMER
VUEK5CAM
REAR CAMERA
FEMALE
MALE
VUEK5CBL
CAMERA 0V (SCREEN)
+12V SUPPLY (RED)
CAMERA VIDEO (YELLOW)
CAMERA AUDIO (GREEN)
1
6
2
5
PLUG WITH COVER
UNUSED (WHITE) ISOLATE
SUZIE
PLUG WITH COVER
1
6
2
5
UNUSED (WHITE) ISOLATE
5"
LCD MONITOR
VUEK5IR
20 MTR EXTENSION
+24V REVERSE TRIGGER
UNUSED
+24V IGN
0V
CAM 1
CAM UNUSED
MALE
FEMALE
VUEK5CBL

Example of a driver's vehicle defect report (goods)

Driver's name	Date

Vehicle no., make and type

Trailer fleet/serial no.	Odometer reading

Daily or shift check (tick or cross)				***Items refer to articulated lorry and trailer combinations**	
Fuel/oil leaks		Lights		Brake lines*	
Battery security (condition)		Reflectors		Coupling security*	
Tyres and wheel fixing		Indicators		Electrical connections*	
Spray suppression		Wipers		Brakes	
Steering		Washers		Security of body/wings	
Security of load		Horn		Markers	
Mirrors		Excessive engine exhaust smoke		Glass	

REPORT DEFECTS HERE	RECTIFIED

Write **NIL** here if no defects found	Driver's signature

Defects rectified by .....

Signature ..... Date .....

ANNEX 18

ANNEX 19

Vehicle registration number	Vehicle make and type	Week	JANUARY					FEBRUARY				MARCH					APRIL			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Vehicle registration number	Vehicle make and type	Week	MAY				JUNE					JULY					AUGUST			
		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	

Vehicle registration number	Vehicle make and type	Week	SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
		37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	

S = SAFETY INSPECTION

I = INTERMEDIATE INSPECTION

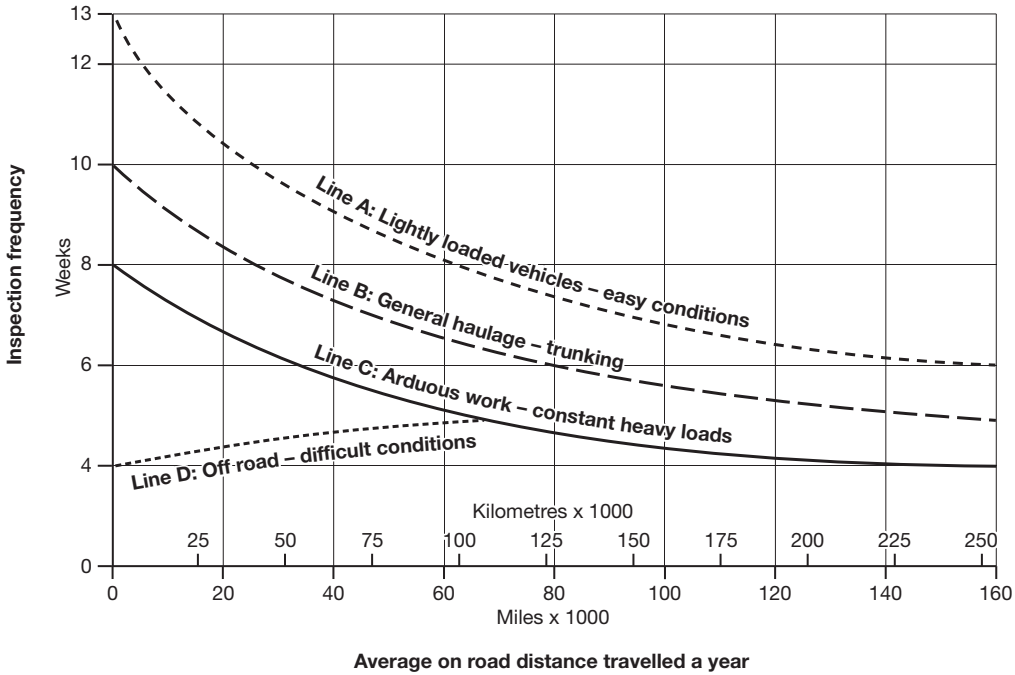
M = MAJOR SERVICE AND INSPECTION

A = ANNUAL TEST PREPARATION (including major service and inspection)

O = VEHICLE EXCISE DUTY RENEWAL

X = WORK COMPLETED

A guide to safety inspection intervals



1. Safety inspection intervals for all vehicles should fall between lines A and C or A and D as appropriate.

2. The chart is only a guide and it is the responsibility of you, the operator, to increase these frequencies should the operating conditions demand it. Equally, they may be decreased if you are confident that this will still be effective in maintaining roadworthiness.

3. The actual inspection interval chosen should be determined by taking into account:

   - the conditions under which a vehicle will be operated;
   - the expected annual mileage;
   - the recommendations of the vehicle manufacturer; and
   - other factors that may increase the risk of vehicles becoming unroadworthy.

4. Vehicles that are only used for part of the year, or that have been out of service for some time, should be inspected before they are first used. When they are being used, the subsequent safety inspection intervals should be determined in accordance with this chart – conditions of use and the equivalent annual mileage (e.g. 20,000 miles covered over a six-month period represents an equivalent annual mileage of 40,000).

5. Trailers not permanently coupled but in regular use need to be assessed on their conditions of work and anticipated mileage.

6. Where there are doubts about what interval to choose, new operators are advised to be cautious and make more, rather than fewer, checks.

7. Exceptional or difficult conditions can be encountered by vehicles operating on unmade roads, e.g. in quarry work or on building or land reclamation sites, where conditions result in accelerated component wear and vehicle damage. Vehicles carrying corrosive substances or working on premises where such substances exist may also qualify for inclusion in this category.

8. It is likely that an appropriate inspection frequency for public service vehicles would fall between curves A and B, up to a maximum period of ten weeks.

Example of a safety inspection record (HGV)

Vehicle registration	Odometer reading

Make and type

Date of inspection	Operator

Notes
IM ref. (col 2) – for more details on each item listed, look under this reference number in the VOSA Inspection Manual
Serviceable (col 4) – enter the appropriate code:
✔ = Satisfactory **R** = Repair required ✘ = Safety item defect **N/A** = Not applicable

Part 1 – Inspection

A: Inside cab (motor vehicles)

Check no.	IM ref.	Item inspected	Serviceable	Defect found	Rectified by
1	18	Driver's seat			
2	3	Seat belts			
3	22	Mirrors			
4	23	Glass and view of the road			
5	25	Windscreen wipers and washers			
6	26	Speedometer/tachograph			
7	27	Horn			
8	28	Driving controls			
9	30	Steering control			
10	37	Service brake pedal			
11	38	Service brake operation			
12	34	Pressure/vacuum warning and build-up			
13	36	Hand levers operating mechanical brakes			
14	39	Hand-operated brake control valves			
15	17	Cab floors and steps			

B: Ground level and under vehicle (motor vehicles and trailers, see items marked * for trailers)

16	16	Cab doors			
17	15	Cab security			
18*	19	Security of body			
19*	20	Condition of body			
20	5	Exhaust emissions			
21*	6	Road wheels and hubs			

Check no.	IM ref.	Item inspected	Serviceable	Defect found	Rectified by
22*	7	Size and type of tyres			
23*	8	Condition of tyres			
24*	9	Sideguards, rear under-run devices and bumper bars			
25*	10	Spare wheel and carrier			
26*	41	Condition of chassis			
27	11	Vehicle to trailer coupling			
28*	12	Trailer parking, emergency brake and air line connections			
29*	13	Trailer landing legs			
30*	14	Spray suppression, wings and wheel arches			
31	33	Speed limiter			
32	42	Electrical wiring and equipment			
33*	43	Engine and transmission mountings			
34	44	Oil leaks			
35*	45	Fuel tanks and system			
36	46	Exhaust systems			
37	54	Steering mechanism			
38*	48	Suspension			
39*	53	Axles, stub axles and wheel bearings			
40	57	Transmission			
41*	59	Brake systems and components			
42*	62	Rear markings and reflectors			
43*	63	Lamps			
44*	66	Direction indicators and hazard warning lamps			
45	67	Aim of headlamps			
46*		Ancillary equipment			
47*	74	Other dangerous defects			

C: Brake performance (roller brake/decelerometer test)

Check no.	IM ref.	Item inspected	
48*	71	Service brake performance	%
49*	72	Secondary brake performance	%
50*	73	Parking brake performance	%

Part 2 – Comments on faults found

Check no.	Fault details
Signature of inspector Name of inspector	

Part 3 – Action taken on faults found

Action taken on fault	Rectified by

Part 4 – Declaration

I consider that the above defects have been rectified satisfactorily

Signature of supervisor .....

NOTE: IT IS ALWAYS THE RESPONSIBILITY OF THE OPERATOR THAT THE VEHICLE IS IN A ROADWORTHY CONDITION BEFORE BEING USED ON THE ROAD

Declaration of Conformity

The Manufacturer of the products covered by this declaration is:

Muldoon Transport Systems Ltd.
181 Clonmore Road,
Dungannon,
County Tyrone,
BT71 6HX.

We herewith declare that:

Equipment:	**Pneumatic Discharge Trailer**
Model number/name:	**GMMS3AMBB (3 axle Mechanical Steer)** **GMHS3AMBB (3 axle Hydraulic Steer)** **GM3AMBB (3 axle Non Steer)** **GMMS2AMBB (2 axle Mechanical Steer)** **GMHS2AMBB (2 axle Hydraulic Steer)**

In accordance with the following Directives:

2006/42/EC and 2004/108/EC	**The Machinery Directive and its amending directives**

has been designed and manufactured to the Functional Specifications as laid down by the manufacturer. A copy of the Functional Specifications can be found in the Technical File which is held at the address below:

Muldoon Transport Systems Ltd
181 Clonmore Road,
Dungannon,
County Tyrone,
BT71 6HX.

The technical documentation required to demonstrate that the above product meets the requirements of the Machinery Directive (and its amending directives) can be made available to the relevant authorities within a reasonable period of time.

Authorised Signature: 

Position Held: **Managing Director**

Date: **19th October 2012** ***(Latest Amendment)***

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY
EC VEHICLE TYPE-APPROVAL CERTIFICATE

Communication concerning: EC type-approval [1]
Of a Type of: complete vehicle [1]

with regard to Directive 2007/46/EC as last amended by Commission Regulation (EU) No. 678/2011

EC type-approval No: e11*2007/46*0883*00*00

Reason(s) for extension: Not applicable

SECTION I

0.1. Make (trade name of manufacturer): Muldoon Transport Systems Limited

0.2. Type: GMO4DA3

0.2.1 Commercial name(s) [2]: Not applicable

0.3. Means of identification of type, if marked on the vehicle: Manufacturer's plate and frame stamping

0.3.1. Location of that marking: On chassis

0.4. Category of vehicle [3]: O4

0.5. Name and address of manufacturer of the complete vehicle [1]:

Muldoon Transport Systems Limited
181 Clonmore Road
Dungannon
Co. Tyrone
Northern Ireland
BT71 6HX
United Kingdom

0.8. Name(s) and address(es) of assembly plant(s): As in point 0.5 above

0.9. Name and address of the manufacturer's representative (if any): Not applicable

22-Apr-13
UK Approval Authority

Job No: VWN268538

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY
EC VEHICLE TYPE-APPROVAL CERTIFICATE

Communication concerning: EC type-approval [1]
Of a Type of: complete vehicle [1]

with regard to Directive 2007/46/EC as last amended by Commission Regulation (EU) No. 678/2011

EC type-approval No: e11*2007/46*0882*00*00

Reason(s) for extension: Not applicable

SECTION I

0.1. Make (trade name of manufacturer): Muldoon Transport Systems Limited

0.2. Type: GMO4DA2

0.2.1 Commercial name(s) [2]: Not applicable

0.3. Means of identification of type, if marked on the vehicle: Manufacturer's plate and frame stamping

0.3.1. Location of that marking: On chassis

0.4. Category of vehicle [3]: O4

0.5. Name and address of manufacturer of the complete vehicle [1]:
Muldoon Transport Systems Ltd
181 Clonmore Road
Dungannon
Co. Tyrone
Northern Ireland
BT71 6HX

0.8. Name(s) and address(es) of assembly plant(s): As in point 0.5 above

0.9. Name and address of the manufacturer's representative (if any): Not applicable

13-May-13
UK Approval Authority

Job No: VWN266537

NOTES

www.muldoon.com

IRELAND:

181 Clonmore Road
DUNGANNON
Co Tyrone
N Ireland
BT71 6HX

t: 00 44 (0) 28 3885 2002
t: 00 44 (0) 28 3885 1873
f: 00 44 (0) 28 3885 2203
e: info@muldoon.com

MULDOON GB:

Unit 1| 2
Kiln Way Industrial Estate
Kiln Way
Swadlincote
Derbyshire
DE11 8ED

t: 0044(0)1283 522956
e: info@muldoon.com

manufacture

service

repairs

parts